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# ANTHRAX IN LOUISIANA

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A patient with anthrax recently entered Charity Hospital at New Orleans. The patient stated he had first noted a painful rapidly progressing lesion on the right hand and had complained of it to a neighbor who asked if he had been skinning dead cattle. When he replied in the affirmative, the neighbor told him he had charbon and directed that he go immediately to his doctor who confirmed the diagnosis by microscopic examination, administered antiserum and had the patient hospitalized over one hundred miles from his home within 72 hours following the stated time of appearance of the cutaneous lesion. When asked if he had ever heard of anthrax or charbon before, the patient named three persons of his acquaintance who, he said, had previously had the disease and had recovered. He knew several farmers who had lost cattle from anthrax in the last few years. In one instance the veterinarian had called the disease anthrax after examining blood from the ear of the dead cow. He further stated that as he was leaving for the hospital his father was burning the hide and carcass of their cow with crude oil.

This situation caused me to consider what was the history and present status of anthrax in Louisiana to make it so well understood and recognized by both layman and physician and led to the following study of the disease.

It appears that anthrax has been prevalent in Louisiana from the days of its early settlement by the French. Carpenter[1] stated that the disease was first observed among the deer in the marshes along the Mississippi River and that soon thereafter it made yearly attacks on cattle in the Feliciana Parishes adjacent to the river. From those times the disease has managed to maintain itself among domestic animals in the state. Cattle, mules, horses and sheep, in the order listed, are the animals most frequently mentioned as contracting anthrax. The frequency of infection in each appears in direct ratio to the numbers of each species in the state. Hogs and dogs are less frequently mentioned, but statements do appear to the effect that these animals, feeding upon the carcasses of anthrax animals may develop the disease and die. Some of the largest epizootics are recorded for the periods between 1830-1850, 1895-1902 and 1920-25. The two largest recent outbreaks appeared in St. Bernard Parish in the fall of 1943 and in twelve of the north-central parishes in the summer of 1946. In connection with the latter, the Louisiana Livestock Sanitary Board reported[2] the loss of 2,000 farm animals and stated further that the disease was of the acute or fulminating intestinal type with no symptoms of illness being shown until a few minutes before the animal's death when convulsions occurred. The accompanying map gives a partial picture of the time of appearance and the distribution of epizootic anthrax in the state but makes no

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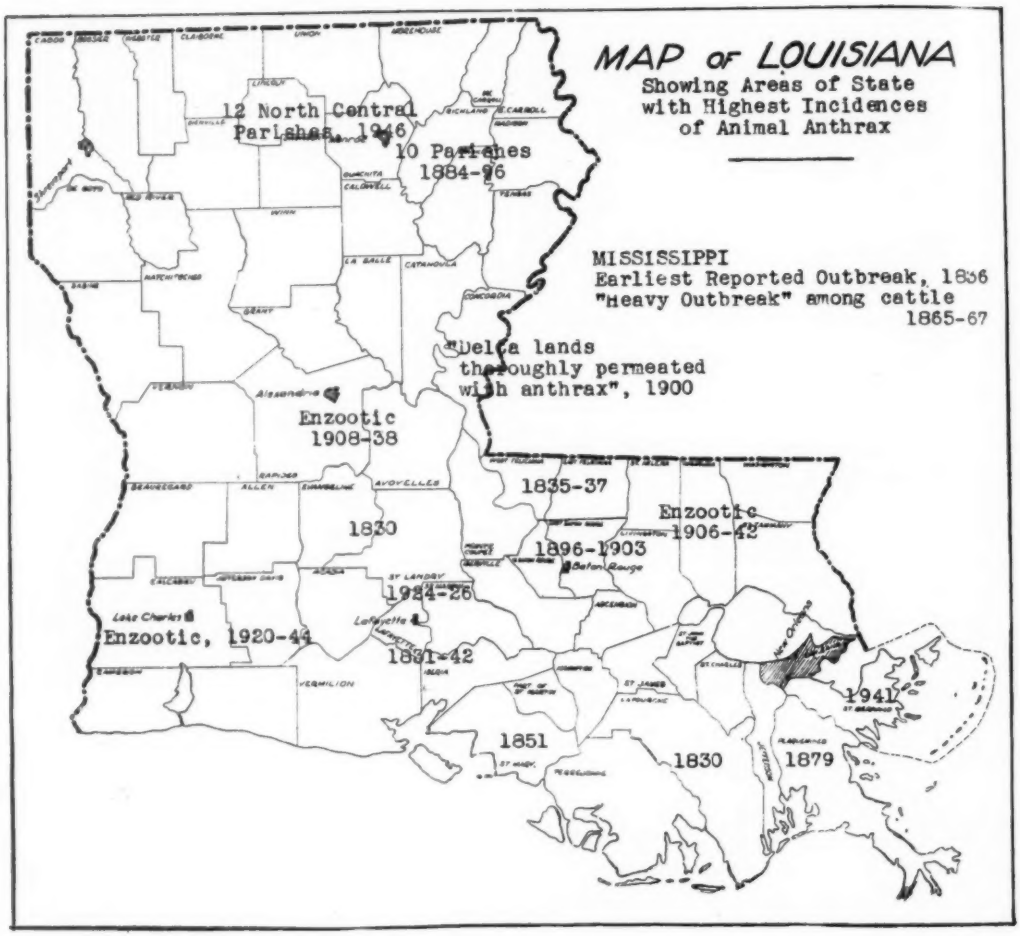


attempt to record small scale occurrence of the disease.

Animal immunization has been practiced extensively even before 1900 in the parishes in which the disease had been most prevalent. Archinard[3] stated in 1896 that a supply of vaccine for animals was always kept on hand in New Orleans. The State Agricultural Experiment Station reported in 1901[4] that over 30,000 immunizations with the Pasteur anti-anthrax lymph materials had been given during the course of one year. Annual immunizations are still continued in some of the central parishes where a few cases may be expected to occur each year in spite of the number of livestock immunized.[5]

Biting flies are more frequently mentioned by Louisiana writers as agents of anthrax transmission than by writers from other areas of the United States. Although mechanical transmission of this disease was not experimentally proved until the time of Mitzmain's studies[6] in 1914, it had been accepted in Louisiana as an important mode of transmission of the disease for at least 80 years prior to this time.[3, 4, 5, 7] The biting flies variously mentioned are the deer-fly, green-headed fly, horse-fly, grey biting-fly and the gad-fly, all of which belong to the same family, *Tabanidae*.[8] The females of this family are blood-sucking and accept a wide range of animal hosts. Their breeding places are in swamps, marshes or along river bottoms where they deposit their eggs near or over the water. Various writers

have stated that anthrax appeared during or following periods of the summer or fall when great numbers of biting flies were present. Dalrymple[4] remarked upon the plague of such flies in 1901 when anthrax was appearing in high incidence near Baton Rouge. Baldridge[9] particularly called attention to the presence of flies in large numbers at the time he attended his cases.

As contrasted with the intestinal type of disease shown in animals inoculated by the ingestion of anthrax-infected forage, insect transmitted disease is characterized by the lesion appearing in or under the skin at the site of injection of the organisms. Since these skin tumors, nodules or carbuncle-like sores, as they are variously described by veterinarians and farmers, are very apparent and are approachable for treatment, more human cases have been reported from contact with cutaneous animal anthrax than for the intestinal type of the disease. This was especially true when veterinary therapy was directed primarily toward the cutaneous lesion and included such procedures as excision, blistering, cauterization or even setting fire to the lesion after covering it with oil. At present exposures are limited to contacts with animals not suspected of having anthrax. One of Louisiana's most recent animal contact cases is that of a veterinarian who developed anthrax after performing an autopsy on a dead bull.

Until such time as the present method of disposal of anthrax carcasses by burning or by deep burial with lime came into general use, the carcasses were either left to disintegrate where the animal had died or were dragged back into the swamps where flies might feed upon them or where surface waters might wash the infection over a wide range of territory. Furthermore, Louisiana's open range laws, permitting livestock to roam at will, have very effectively combined with other factors favoring anthrax transmission and thus, during the course of the years, large areas of the state have been seeded with the highly resistant spores of *B. anthracis*.

It appears that the first scientific report of human anthrax in Louisiana was made in 1830 by Ellison.[10] He described eight cases in the south and central portions of the state. One of them was a Spaniard who had eaten beef from an animal that had died; another, a man who had skinned a dead cow; and the remaining six were persons who had been bitten by insects. The first two of the patients died. Smith[11] reported attending cases in the same area of the state during the period from 1834-1843, but gives few details concerning his cases. Carpenter[1] described eight cases that occurred in the Feliciana Parishes during the years 1835-1837. These persons had either handled hides of farm animals that had died of anthrax or had been bitten by insects. Baldridge[9] in 1851 described a series of human cases associated with epizootic anthrax in St. Mary and Vermilion Parishes. While he definitely associated the biting fly with transmission of the disease, he stated that persons (drovers, shepherds and butchers) having most intimate contact with farm animals were most likely to contract the disease. In 1879 Fox[12] mentioned anthrax as a disease long established in Plaquemine Parish (along the lower stretches of the Mississippi River) and specifically stated that he had seen six cases of the disease in 1853. These cases were confined to the residents of one plantation. The first of them was the hostler who had cut strips from the hides of animals that had died of anthrax the previous spring. The remaining cases were among persons living in cabins adjacent to where the hides were stored.

Staples and Dalrymple,[13] discussing the 1896 epizootic in ten northern parishes (including Tensas, E. Carroll, Richland, Franklin and Madison), mentioned a human case in Madison Parish; that of a negro who had attended sick mules. They included Dr. Cordill's report of the 1884 anthrax attack in Franklin Parish, in which he said, ". . . and many people were affected, and some died from the disease. All of those living, who were attacked have scars to show for it."

Dabney's case,[14] that of a man who

"worked in a hide-store" in New Orleans, is one of the few cases reported in the medical literature during the last half of the nineteenth century. It has the distinction of being the first human case to appear in the yearly statistical reports (1898) of the state. Subsequent to 1900, when case reporting became less fragmentary and when mortality reports had become more complete and more nearly accurate, human anthrax cases have been recorded with definite regularity. However, the number of cases reported probably has never approached the real incidence level of the disease. For example, during the period of unusually high prevalence of the disease in the Evangeline Parishes (1920-1925) one physician treated more than sixty human cases of anthrax in a single year.[5] Of this number, a total of one case achieved entry into the state's statistical records. That incomplete case reporting still exists is evidenced by the 1945 reports of one case and two deaths. Table 1 gives the cases reported to the Louisiana State Department of Health for each year since 1920.

TABLE 1

Human Anthrax Cases Reported in Louisiana For the 26-Year Period, 1920-1945, Inclusive*

| Year | Number of Cases | Year | Number of Cases |
|---|---|---|---|
| 1920 | 6 | 1933 | 3 |
| 1921 | 4 | 1934 | 6 |
| 1922 | 4 | 1935 | 3 |
| 1923 | 18 | 1936 | 1 |
| 1924 | 11 | 1937 | 4 |
| 1925 | 1 | 1938 | 3 |
| 1926 | 9 | 1939 | 2 |
| 1927 | 3 | 1940 | 2 |
| 1928 | 6 | 1941 | 3 |
| 1929 | 2 | 1942 | 6 |
| 1930 | 6 | 1943 | 3 |
| 1931 | 3 | 1944 | 0 |
| 1932 | 3 | 1945 | 2 |
| | | 1946 | 0† |
| | | Total | 114 |

* Taken from Communicable Disease Reports of the Louisiana State Department of Health.

† To November 1, 1946.

The comparative incidence of anthrax reported in Louisiana (based upon the summary of Smyth[15] and the U. S. Public Health Reports[16]) is shown in table 2. On a population basis it is evident that this state reports a comparatively high anthrax incidence. The states with higher frequencies are certain of the New England and Middle Atlantic states wherein the disease differs epidemiologically in that it appears among industrial workers handling imported hides, hair and wool. Table 3, drawn from sixty Louisiana case histories from which sufficient data could be obtained, shows that anthrax, as it has occurred locally, is almost entirely an agricultural disease rather than one of urban industry. While 13 urban dwellers with such occupations as electrician, clerk and chauffeur are included in the 60 cases, investigation reveals that all probably got their infection in rural areas. The clerk, for example, worked in a store in New Orleans but used part of the liver of a dead cow for bait during a four day fishing trip in Alabama and returned to New Orleans with the cutaneous lesion already evident and painful. The electrician, wiring a house in the country, suffered from numerous bites of "cattle flies" while at work. The cutaneous lesion appeared within 24 hours at the site of one

TABLE 2

Comparison of Numbers of Human Anthrax Cases Reported in the United States with Number of Cases Reported in Louisiana.

| Period | United States Number of Cases | United States Yearly Average | Louisiana Number of Cases | Louisiana Yearly Average |
|---|---|---|---|---|
| 1919-1938 | 1,683 | 88 | 93 | 4.65 |
| 1938-1942 | 375 | 75 | 16 | 3.20 |

TABLE 3

Occupation in Relation to Exposure to Anthrax in Louisiana*

| Occupation | Cases | Contact with animals or animal products | Primary lesion developing at site of fly bite | No history of contact with sick animals or of fly-bite |
|---|---|---|---|---|
| *Rural* | | | | |
| Farmer or farm laborer | 41 | 24 | 10† | 7 |
| Housewives | 4 | 3 | 0 | 1 |
| School | 2 | 2 | 0 | 0 |
| *Urban* | | | | |
| City dwellers whose work or recreation took them to country †† | 12 | 10‡ | 2‡ | 0 |
| Worked in hide store | 1 | 1 | 0 | 0 |
| Totals | 60 | 40 | 12 | 8 |

* Taken from records of the Charity Hospital at New Orleans, from Dabney,14 Baldridge,9 and from the Communicable Disease Reports of the Louisiana State Department of Health.

† Six of these cases also gave a history of definite contact with anthrax infected animals.

†† Group includes three laborers, one butcher, one blacksmith, one clerk, one carpenter, one fisherman, one chauffeur, and one electrician.

‡ Contacts occurred in rural areas.

of the bites. The chauffeur cut his hand while skinning cows that had died suddenly on the farm of a friend. The only obtainable case that is definitely connected with industrial processing of hides is Dabney's case previously mentioned. No data are given, however, as to whether the hides were domestic or imported. The only case wherein infection was probably obtained outside of Louisiana is that of the clerk mentioned above.

Table 4 compares the type of anthrax and the location of the cutaneous lesion for a series of 640 cases throughout the United States[15] with a smaller series of 44 cases cared for at Charity Hospital at New Orleans. While ocular, pulmonary and intestinal anthrax do occur in Louisiana, no patients have been admitted to Charity Hospital and few to any other hospital, as indicated by correspondence with 40 of the larger hospitals of the State. Physicians say that when they have been called to see these patients their reaction has been that since death appeared certain and imminent, the patient might better be left in his home. The location of the cutaneous lesions in the Louisiana cases may be influenced by the number of insect transmitted infections, in so far as the lesion may appear on any exposed body part. Certainly there is no large percentage of lesions on the back and shoulders as appear in persons carrying bales of infected hides.

TABLE 4

Location of Primary Lesion in Anthrax Cases

| | 640 Cases throughout United States 1919-1938 | 44 Cases Charity Hospital 1904-1944 |
|---|---|---|
| *Internal Anthrax* | | |
| Pulmonary | 4 | 0 |
| Pulmonary and intestinal | 2 | 0 |
| Intestinal | 2 | 0 |
| Meningeal | 3 | 0 |
| *External Anthrax* | | |
| Face, neck and head | 309 | 8 |
| Upper extremity | 264 | 26 |
| Lower extremity | 23 | 2 |
| Chest, abdomen and back | 23 | 3 |
| Multiple lesions | 9 | 5 |
| Not stated | 1 | 0 |

The only reference found regarding a second attack of anthrax in any person in Louisiana is that of the negro in Madison Parish who attended sick mules.[13] Hull[17] described four cases found in the literature and stated that in one instance the second attack occurred within a year following the first infection. No mention is made of the interval between the two attacks suffered by the Madison Parish negro. No reference has been found to establish person-to-person transmission in Louisiana although it is occasionally reported elsewhere.[17]

No proved cases of shaving brush anthrax have been found. The nearest approach is the case, recorded at Touro Infirmary at New Orleans, of a 49 year old white farmer who scraped the surface of a pimple on his neck one morning while shaving. A few hours later the pimple had become a large painful lump from which anthrax bacilli were obtained after admission to the hospital. The patient said that on the morning when he scraped the pimple he had used a new shaving brush and strop for the first time. Two days previously, however, he had examined a stray hog found dead on his property. Cultures from the shaving brush, stone, strop and mug, sent to the State Laboratories, were reported negative for anthrax bacilli. The hog was not examined, but since animal anthrax was present in the area at that time (W. Baton Rouge Parish, 1923), it appears to have been the probable source of the infection.

An unreported series of four related cases[5] demonstrates exposure to intestinal anthrax and the chances against its development. In 1924, a white farmer from Iberia Parish appeared at his physician's office with a four day old anthrax lesion on his lower arm. He said he had killed and skinned a cow that appeared to have been suffering from physical injury. He had dressed the carcass and sold the meat to neighboring families. Among 53 persons exposed either to the raw or cooked meat, three cases of anthrax developed. These were all of a cutaneous nature and were limited to those who had prepared the meat for the table. Billings[18] has said that proper pickling or thorough cooking will destroy anthrax organisms and cites the report of

200 persons who ate meat taken from a diseased ox. None of those who ate the cooked meat became ill, but five persons who handled the uncooked meat developed anthrax. While much Louisiana home-cured meat is salt pickled, it is not consumed without subsequent cooking. Furthermore, very little smoked meat of a variety to be consumed without cooking is processed in the rural areas of the state. The small amount of wool grown in the state and the absence of any large woolen or hair-processing industries has probably been responsible for holding pulmonary anthrax to similar low percentages of total anthrax cases.

Smyth[15] in 1941 reported an anthrax case fatality rate of 22 per cent for the United States for the period 1919-38 with 16 per cent case fatality for the last five years of the period. For the same time period Louisiana stood higher with 30 and 22 per cent case fatalities, respectively. Since that time anthrax deaths have decreased considerably. Lucchesi and Gildersleeve[19] reported treating 67 cases in Philadelphia without a fatality. Gold[20] reported 60 industrial cases treated between 1933 and 1942 with only one fatality. Tabershaw and Morris[21] reported a case fatality rate of 9.3 per cent (four of 43 cases) for Massachusetts for the period 1935-1942. While the Louisiana fatality rates are higher for reported cases, there is much reason to believe that these rates are quite inaccurate as only the more malignant type of case is reported. Louisiana physicians state that the cutaneous case is often not malignant, that it assumes the characteristics of the common carbuncle and that etiologic differentiation is ascertained only by microscopic examination of crusts from the lesion. Bell and Legge[22] in London in 1912 called attention to the frequency of this type of non-malignant anthrax. Local physicians also state that if they see the patient before septicemia has occurred, they can care for him adequately in his own home. These cases are seldom reported.

Of 44 patients admitted to Charity Hospital from 1906 to date and with the diagnosis by laboratory findings, only five deaths have occurred. Two of these were in patients with the primary lesion on the face, two with multiple lesions on the arms, and the fifth with the cutaneous lesion in the area of the inguinal nodes. All five were admitted before the days of sulfonamide therapy. Four admitted since 1940 have responded to sufapyridine, sulfanilamide or sulfathiazole used in conjunction with tetanus antiserum.

The only Louisiana case history[23] obtainable in which penicillin was used was one of the two cases reported in 1945. This boy cut his foot on a piece of wire near a manure pile. Four days later, when the foot and ankle were swollen and one degree of fever was present, the patient was taken to a local physician because of the fear of tetanus. Four or five days later, upon admission to the hospital, the temperature was 101° and examination revealed a woody, brawny, painless induration of the entire leg. The diagnosis of anthrax septicemia was made when anthrax bacilli were found in the blood smear. An initial dose of 100,000 units of penicillin was given followed by 50,000 units every two hours. The child died 52 hours after admission to the hospital. While this patient did not respond favorably to penicillin, this failure is possibly due to the fact that treatment was begun late in the course of the disease on the eighth or ninth day when septicemia was well established. Had the case been recognized earlier, as usually happens in Louisiana, more favorable results might have been expected. Current literature, beginning to report favorable anthrax case responses to penicillin therapy, is concerned with cases in which diagnosis is made earlier and penicillin is given before septicemia has occurred. For example, Murphy, La Boccetta and Lockwood[24] reported prompt clinical response to penicillin in three cases of cutaneous anthrax seen on the third, fourth and fifth days, respectively, after appearance of the skin lesion and with blood cultures negative for *B. anthracis*.

The seasonality of human anthrax shows a pattern of case distribution throughout

the year with a definite peak during midsummer (table 5). This seasonal case frequency in man parallels that of animals in the state.

Distribution of human cases in the parishes of the state is again similar to the distribution of the disease among animals with no reports of human cases found for certain of the north and northwestern parishes and with animal anthrax less frequently reported from the same areas. Anthrax is in many ways associated with the bayous, marshes or streams of the state. One writer states that as anthrax causes a high fever and an associated thirst for water, the sick animal goes to the bayou and dies there. Others point out the old practice of dragging the carcasses of all dead animals back into the swamps. Others have stated that anthrax first appears among cattle pastured in swampy territory. Others call attention to the frequent reversal of direction of water flow in a bayou with the result that infection may be carried either up- or down-stream. The northwestern section of the state, with less frequent appearance of anthrax, contains the highest lying land within the state where an elevation of 400 feet above sea-level is reached, receives less than the average yearly precipitation (57 inches) for the state, and, as a result, is better drained with less flooding or back-flow of surface waters. It appears that these features have been responsible for reduced anthrax incidence in the area.

TABLE 5

Seasonal Occurrence of 111 Cases of Anthrax in Louisiana By Month of Onset (for the Period, 1920-45, Inclusive)

| | Months | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Jan. | Feb. | March | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
| Cases | 1 | 1 | 5 | 2 | 4 | 18 | 32 | 28 | 6 | 6 | 5 | 3 |

Reduction of numbers of human cases has paralleled reduction of numbers of animal anthrax cases. With an awareness of the mode of transmission of the infection to man, the proper disposal of the carcass of the anthrax animal and measures for control of the infection in exposed animals (quarantine and immunization), no human cases were observed in either of the last two epizootics: St. Bernard Parish in 1943 and the north central parishes in 1946. However, due to soil contamination with a long-lived type of spore-forming bacillus, occasional cases are still to be expected, as, for example, the 1945 case described herein.

REFERENCES


1. Carpenter, W. M.: Cited by Hull (17).
2. Written communication from Dr. E. P. Flowers, Louisiana State Live Stock Sanitary Board, Baton Rouge, October 15, 1946.
3. Archinard, P. E.: Preventive inoculation in cases of charbon in animals, New Orleans M. & S. J., 49:164, 1946.
4. Dalrymple, W. H.: Anthrax; preventive inoculation in Louisiana, Am. Veterinary Rev., 25:640, 1901.
5. Personal communication from Dr. A. Landry, Delcambre, Louisiana.
6. Mitzmain, M. B.: Collected studies on insect transmission of *Trypanosoma evansi* and a summary of experiments in the transmission of anthrax by biting flies, U. S. P. H. S. Hygienic Laboratory Bulletin No. 94, 1914.
7. Dalrymple, W. H.: Anthrax, Bulletin of the Agricultural Experiment Station of the Louisiana State University Agricultural and Mechanical College, Second Series, No. 60, 1900.
8. Matheson, R.: The *Tabanidae*. Chapter 14:315-327, Medical Entomology. Springfield, Charles C. Thomas Co., 1932.
9. Baldridge, J. H.: Vel carbuncle, charbon, anthrax, prevailing as an epidemic in the parishes of St. Mary and Vermilion, Louisiana, New Orleans M. & S. J., 8:200, 1851.
10. Ellison, J. Z.: A description of a disease called charbon that prevails between the Sabine and Red Rivers, Western J. M. & Phys. Sci., 4:35, 1830.
11. Smith, J. I.: Remarks on charbon or anthrax, New Orleans M. & S. J., 8:309, 1851.
12. Fox, D. R.: Topography of the Parish of Plaquemine and its medical history, Proc. Louisiana State Medical Society, 1879. Pp. 171-175.
13. Staples, S. B., and Dalrymple, W. H.: Charbon or anthrax with experiences during recent outbreaks in North Louisiana, Bulletin of the Louisiana State Experiment Station, Second Series, No. 44, 1896.
14. Dabney, T. S.: A case of anthrax (charbon), New Orleans M. & S. J., 51:377, 1898-99.
15. Smyth, H. F.: A twenty-year survey of anthrax in the United States. Symposium on anthrax, Commonwealth of Pennsylvania, Department of Health, April 1, 1941.
16. Prevalence of disease (statistical table), Pub. Health Rep., 59:376, 1944.
17. Hull, T. G.: Disease Transmitted from Animals to Man. Ed. 2. Springfield, Charles C. Thomas Co., 1941. Pp. 37-65.
18. Billings, F. S.: Anthrax. Twentieth Century Practice of Medicine. New York, William Wood and Co., 1898. Vol. 15, pp. 411-458.
19. Lucchesi, P. F., and Gildersleeve, N.: The treatment of anthrax, J. A. M. A., 116:1506, 1941.
20. Gold, H.: Anthrax; a review of 60 cases with a report on the therapeutic use of sulfonamide compounds, Arch. Int. Med., 70:785, 1942.
21. Tabershaw, I. R., and Morris, G. E.: Epidemiologic aspects of anthrax in Massachusetts, New England J. M., 228:92, 1943.
22. Bell, J. H., and Legge, T. M.: Anthrax. In Albutt, C., and Rolleston, H. V.: System of Medicine. Vol. II. Part I. Pp. 227-257. London: Macmillan and Co., 1912.
23. Personal communication from Dr. N. M. Brian, Jr., Baptist Hospital, Alexandria, Louisiana.
24. Murphy, F. D., LaBoccetta, A. C., and Lockwood, J. S.: Treatment of human anthrax with penicillin, report of three cases, J. A. M. A., 126:948, 1944.

# THE STATUS OF ABORTUS INFECTIONS IN THE UNITED STATES*

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Brucellosis in the United States presents a confusing problem to the medical profession. Because of its protean manifestations, the disease is not generally recognized. This failure in recognizing brucellosis is partly due to the fact that the majority of the cases are of the abortus variety, and observations indicate that *Brucella abortus* has been attenuated to such an extent that the disease has lost its clinical identity and an original diagnosis is difficult.

In consideration of the widespread prevalence of the organism in milk and dairy products and of the common usage of these foods in the United States, it is not surprising that the abortus variety should attain a more rapid and greater attenuation than would the suis or melitensis types. Extensive traffic in cattle and dairy products has assisted greatly in spreading the infection throughout the country, and this, also, has contributed to the attenuation of the organism, and to the difficulties presented in both clinical and laboratory diagnosis.

The true incidence of the disease is not known but judging from the possible sources of infection in cattle it is probable that brucellosis is most common. Evans[1] estimates that between 6 and 10 per cent of all cattle excrete the organism. Clark[2] states that 50 per cent of all milk-producing animals in the South are in herds infected with *Brucella abortus*, and Horn[3] showed that infection was present in 38.4 per cent of all dairy herds in the United States, which were estimated to include half of the dairy cows in the country. As early as 1911, Schroeder and Cotton[4] found that 14 per cent of all market milk contained *Brucella abortus*.

These figures indicate that the opinion of Gould and Huddleson[5] is probably correct in estimating that about 10 per cent of the population of the United States has become infected and that probably one per cent of these infected persons are ill with brucellosis at any given time. Wherever careful studies have been made, cases of brucellosis have been discovered, indicating that many of the cases are unrecognized and that the incidence of the chronic disease cannot be stated. The incidence of acute brucellosis has probably decreased because of the attenuation of the organism.

The distribution of the organism and the manner and frequency of contact with the organism are the chief factors that govern the change of pathogenesis of any infectious disease. In most such diseases contagion results from casual contact. Only in brucellosis, as noted in endemic areas, is there daily human ingestion of varying numbers of pathogenic organisms over a relatively long period of time. It must be admitted that either the patient has vaccinated himself against the disease or that he has it in some form, however mild or dormant.

The cow has played an important role in the attenuation of the organism. It is apparent that the disease has undergone the same changes in cattle as it has in the human. Veterinarians report that previously much time was devoted to attending cows that had aborted or delivered dead fetuses or that showed other definite signs of Bang's disease. In more recent years there has been a marked diminution in the incidence of these diagnostic signs. It is suggested that the disease is probably most prevalent in cattle and that the virulence of the infection has been altered by the cow.

A survey in a Southern rural section showed that 20 per cent of the cattle reacted positively for Bang's disease and in some dairy herds the incidence was as high as 60 per cent. It was consistently noted that only the finest stock were the positive reactors. These observations suggest that perhaps the better cattle were able to develop some immunity, whereas the poorer cattle were diseased without showing the presence of antibodies.

There is no other disease in which a host other than man plays such an important

*Presented at the Inter-American Congress for the study of Brucellosis, Mexico City, October 28—November 2, 1946.

role. The widespread distribution of the organism in milk and the attenuation of it by the cow over a period of years has resulted in a chronic and obscure disease most difficult to diagnose and obstinate to treat.

We may contend that the virulence and the antigenic properties of the organism are reduced to such an extent as to be unable to stimulate the formation of sufficient antibodies in the host completely to overcome the infection. This appears to be a plausible explanation of the reason for the existence of the disease in a chronic and obscure form and the absence of agglutinins in such cases.

This attenuation of *Brucella abortus* is not characteristic of the strain but rather may be attributed to the prevalence of the organism in cattle and the manner and frequency of contact by humans. The common use of contaminated milk is more conducive to the rapid attenuation of abortus as compared to suis or melitensis except in those areas where goat's milk is generally used. In Malta, brucellosis of melitensis origin exists as a low grade infection whose pathogenesis is similar to the abortus infections in the United States.

Thus it becomes apparent that the manifestations of brucellosis vary in different regions depending upon the extent and duration of the disease in animals. It is also apparent that the relative value of the laboratory procedures for diagnosis likewise varies depending upon the degree of attenuation of the organism in any particular area.

The widespread prevalence of the abortus infection among cattle for more than 150 years in the United States constitutes sufficient proof that the disease must have been most common in man prior to its recognition as a clinical entity. The prevalence and duration of the infection in endemic areas also suggest that the organism has been attenuated and in many instances, it exists as a non-pathogenic organism.

Though not generally recognized, this change of the pathogenesis of *Brucella abortus* has conformed with the basic principles of immunology and offers a satisfactory explanation for many of the difficulties encountered in both diagnosis and treatment.

Other diseases have undergone similar changes as a result of the attenuation of the organism and subsequent alteration of the manifestations has made clinical diagnosis most difficult.

The present situation for brucellosis closely resembles that for syphilis. In the great epidemic at the end of the fifteenth century, syphilis existed as an acute infectious disease manifested by high fever and symptoms of such severity that early death frequently resulted. This epidemic had all the characteristics of a virulent plague. Evidence indicates that with the rapid syphilization of the world, the virulence of the disease was attenuated and that within fifty years syphilis assumed the chronicity as presented today. As in the case of brucellosis the prevalence of the disease was denied by physicians until Wassermann devised a specific test in 1905.

Further observations indicate that the pathogenesis of syphilis and brucellosis bear a resemblance as regards the presence of antibodies. Stokes[6] states: "while it has been shown that agglutinins and lysins for the *Spirochaeta pallida* are formed, the amounts are insignificant so far as inhibitive effect on the disease is concerned." An analogous condition exists in endemic areas where brucellosis and Bang's disease are prevalent. Consequently the diagnosis of chronic brucellosis is as difficult as would be the diagnosis of syphilis without the aid of the Wassermann reaction.

The two diseases have other likenesses in common. The protean manifestations of brucellosis and syphilis are similar in that they have lost their clinical identity. They no longer present the symptoms of acute reaction following initial infection. They have lost their particular affinity for certain tissues, a characteristic yet retained by most other infectious diseases. Consequently the resultant pathology has been found in practically all of the tissues of the body. Both diseases may be congenital. In consideration

of the clinical evolution of diseases, it becomes apparent that brucellosis and syphilis have undergone many similar changes.

This change in the pathogenesis of *Brucella abortus* is directly responsible for the difficulties encountered in both clinical and laboratory diagnosis. With the development of this chronicity, the symptom complex of brucellosis varies to such an extent that recognition is practically impossible. If one is familiar with the situation and knows that brucellosis presents such varying manifestations, the disease might be suspected and ultimately detected by means of differential diagnosis and the elimination of other possible conditions.

The classical description of brucellosis in old text books was based on observations of the acute infection. In endemic areas acute brucellosis is rarely seen and is usually of short duration.

This attenuation of *Brucella abortus* has detracted much from the value of laboratory procedures for diagnosis. The agglutination test is of little value in the diagnosis of chronic brucellosis of the abortus variety. These cases are of such low grade infection that one can hardly expect to find the presence of antibodies. In endemic areas agglutinins in any titer, however low, are of significance in the presence of suggestive symptoms. A negative agglutination, moreover, never excludes the possibility of infection. Other factors detract from the value of the agglutination test in the diagnosis of chronic brucellosis, namely the lack of a standard antigen. A marked variation has been noted in the agglutinability of the same commercially prepared antigens. In my opinion, a more sensitive antigen is necessary in order to detect low grade Brucella infections.

The intradermal test alone is not sufficient for diagnosis. A positive reaction indicates prior contact with Brucella but it does not distinguish past from active infection. Skin sensitivity has been noted in many patients who have never had evidence of disease. In endemic areas of Bang's disease a high incidence of positive reactions is to be expected.

The opsonophagocytic index is of questionable value and the procedure is not a practical one to be employed in the general practice of medicine. The difficulties encountered in growing *Brucella abortus* sharply limit the use of culture work in diagnosis.

In consideration of the changes that have taken place in brucellosis of the abortus variety, it appears plausible to assume that the complement fixation test would be the procedure best adapted for diagnosis of the chronic infection. Larson and Sedgwick[7] in 1913 used this test to suggest that bacillus abortus was pathogenic for humans long before Evans noted the resemblance between *B. abortus* and melitensis. The little work that has been done in the United States on complement fixation reactions in brucellosis has not been sufficient definitely to establish its value.

## CONCLUSION

As a brief resume we may conclude that abortus infections are widespread throughout the United States in both humans and animals and that the organism has been attenuated so that clinical and laboratory diagnosis are difficult. Wherever brucellosis is prevalent and under circumstances such as exist in the United States, one may expect a change in the pathogenesis of the organism. The close similarity of brucellosis and syphilis should tend to bring about a more complete understanding of the problems presented by brucellosis.

## REFERENCES

1. Evans, Alice: Chronic brucellosis, J. A. M. A., 103:665, 1934.

2. Clark, Anson L.: Urinary tract infection with brucel-neurasthenia, J. Kansas M. Soc., 40:498, 1939.

3. Horn, W. S.: Chronic brucellosis as a major cause of neurasthenia, J. Kansas M. Soc., 40:498, 1939.

4. Schroeder, E. C., and Cotton, W. E.: Undescribed pathogenic bacterium in milk, Am. Vet. Rev., 40:195, 1911.

5. Gould, S. E., and Huddelson, L. F.: Diagnostic methods in undulant fever with results of survey in 8,124 persons, J. A. M., 109:1971, 1937.

6. Stokes, John H.: Modern Clinical Syphilology, Philadelphia, W. B. Saunders Co., 2nd ed., 1934. pp. 38.

7. Larson, W. P., Sedgwick, J. P.: The complement fixation reaction of the blood of children and infants using B. abortus as antigen, A. J. Dis. Children, 6:326, 1913.

# THE TOXIC EFFECTS OF DIGITALIS*

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## INTRODUCTION

Upon reviewing the literature concerning this subject, it was apparent that, although a great deal had been written, there had been no attempt to combine this knowledge into a usable and practical reference for the practicing physician. It was with this fact in mind that the present paper was written.

## GENERAL

The first description of the toxic effects of digitalis was written by William Withering in his paper, *"An Account of the Foxglove and Some of its Medical Uses."* This was a description of the toxic effects of massive single doses of digitalis. Today one seldom sees this particular type of toxic manifestation, but sees rather, the toxic effects of digitalis due to the cumulative action of smaller doses. Today a great deal is being written concerning the relative toxicity of the different crystallized glycoside compounds, but since very little of this material has been clinically accepted, the present paper will deal only with the toxic effects of the standard products now in general and accepted usage.

For some time after the discovery of its therapeutic effect, digitalis was considered a panacea for anything that might be wrong or apparently wrong with the heart. Today, however, it is an accepted fact that digitalis is clinically indicated in the following conditions:

1. *Congestive Heart Failure*: Congestive heart failure is the principal indication for the use of digitalis. It is equally applicable in either left or right sided failure, and is not contraindicated by an arrhythmia or valvular defect. It has its greatest efficiency in congestive heart failure of nontoxic origin and disappointing results occur in congestive heart failure of other etiology.

2. *Auricular Fibrillation*: Digitalis should be used in auricular fibrillation only if it is caused by, or is accompanied by, congestive heart failure.

3. *Auricular Flutter*: The use of digitalis is the same as in auricular fibrillation.

4. *Paroxysmal Tachycardia*: Digitalis should be used in paroxysmal tachycardia only when the paroxysmal tachycardia is supraventricular in origin. Even then, its use should be restricted to selected cases and should be used only as a last resort.

There is no indication for the use of digitalis in the following entities:

1. *Coronary Thrombosis*: If congestive heart failure is associated with this, one must use his clinical judgment as to whether or not digitalis should be given.

2. *Angina Pectoris*: Digitalis is of questionable value if the origin is associated with congestive heart failure. There is no indication for its use if the patient is not in congestive heart failure.

3. *Pneumonia*: There is absolutely no indication for digitalis in pneumonia.

4. *Thyrotoxicosis*: If the patient is not in congestive failure, there is no indication for the use of digitalis. If the patient is in congestive failure, digitalis may be used with great caution, and with only minimal success.

5. *Diphtheritic Myocarditis or Other Infectious Myocarditis*: The indications for digitalis are the same as in thyrotoxicosis.

6. *Arrhythmias*: The arrhythmia must be either caused by, or associated with congestive heart failure before digitalis can be expected to accomplish any results.

7. *Valvular Lesions*: In general, it may be said that one obtains much poorer results in luetic valvular lesions than with rheumatic valvular lesions.

In their discussion of the toxicity of digitalis, Goodman and Gilman repeatedly emphasized that one must realize the toxic effects of digitalis are in reality simply an over extension of the normal effects. Consequently in this paper, the toxic effects will be compared with the normal effects.

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The opinions and assertions in this article are those of the writer and are not to be construed as official or reflecting the views of the Navy Department.

### EFFECTS OF DIGITALIS ON THE CARDIOVASCULAR SYSTEM

Chamberlain has divided the toxic effects of digitalis into three levels of poisoning; therapeutic stage, vagus, or inhibitory stage, and muscular stage.

Slowing down of the previously fast pulse rate is the principal indication in the therapeutic stage. At this stage, digitalis is exerting its principal effect on the myocardium alone.

In the second stage, the vagus stage, the digitalis is exerting its principal effect on the vagus and on the specialized conduction system of the heart. The pulse rate is decreased below 40-50, and various odd arrhythmias are set up, such as idioventricular rhythms and different degrees of heart block. Passage into this stage indicates the complete cessation of digitalis administration.

In the muscular stage, the pulse rate is increased, again due to the increased muscular irritability. Multiple extrasystoles are set up, bigeminal rhythm is frequently found, and the patient may eventually be precipitated into ventricular fibrillation and death. In this stage digitalis is exerting extreme toxic effects both on the myocardium and on the special conduction of the heart, and on the vagus.

Keeping these generalizations in mind, I will now go into a more detailed discussion of the toxic effects of digitalis on the cardiovascular system.

### EFFECT ON HEART MUSCLE

Increased force of the systolic contraction is the principal effect of therapeutic doses of digitalis. All other effects on the cardiac muscle are subject to this. The drug increases the systolic tension several fold, whether the muscle is contracting at optimal or at high diastolic tension. It acts directly on the individual myocardial strands to increase the force of the systolic contraction, and is independent of other cardiac or extracardiac factors. This increased force of the systolic contraction in turn results in the heart being able to take care of an increased venous return which results in an increased diastolic filling and lowers the venous pressure. There is a decreased length of the systolic period. Thus there results an increased mechanical efficiency of the heart and consequent increased output which is probably the principal factor needed in decompensation.

The mechanism of the early toxic effects of digitalis on the musculature is unknown. The effects are thought to be due to a heightened irritability of the musculature to the conduction stimulus. The early toxic effects produce the following signs. If the patient has a normal pulse, and is in congestive heart failure, one begins to see multiple regular extrasystoles, or premature ventricular contractions. These extrasystoles arise in response to supraventricular impulses. If the patient is fibrillating, of course, extrasystoles are not noticed. With an increase in the toxic effects, one begins to see a pulsus bigeminus which is definite evidence of increasing intoxication, and is definitely dangerous. This arrhythmia has its origin in the ventricles and may progress to paroxysmal ventricular tachycardia and thence to ventricular fibrillation. Persistence of this arrhythmia indicates either lowering of digitalis dosage or complete discontinuance of its administration. Robinson states that one gets pulsus bigeminus only when 80 per cent of the minimal lethal dose has been given.

In 1943 Dearing, Barnes, and Essex carried out some experiments on cats to show the histopathologic effects of toxic doses of digitalis. None of the hearts of the cats showed structural change on administration of 40-50 per cent minimal lethal dose; one-fourth showed changes with 60 per cent minimal lethal dose; and seven-eights showed changes with 70-80 per cent minimal lethal dose. The following conclusions were reached: (1) With toxic doses of digitalis the changes that occur are; a degeneration of the myocardial fibers (vacuolization, fragmentation, and disintegration in focal zones of myocardium), hemorrhage, and exudation of low grade inflammatory cells. (2) These changes occur most often in the papillary muscles, second in the left ventricular wall, next, in the in-

traventricular septum, and fourth in the right ventricular wall. They are usually located in the subendocardial regions. (3) These changes heal by fibrosis if the cat does not die. They become exceedingly difficult to locate within six to eight weeks after discontinuance of the digitalis.

EFFECT ON THE HEART RATE

Digitalis usually decreases the heart rate. This is probably accomplished by reflex stimulation of the vagus due to restoration of cardiac compensation. There is no discernible effect on the pacemaker except in toxic doses. In therapeutic dosages, there is no clinical effect of digitalis on the conduction system. Pharmacologically speaking, it is thought that digitalis begins depression of the conduction system even in therapeutic dosages. However, this depression is not manifest until toxic levels are reached.

When toxic levels are reached, the digitalis begins to exert an effect on both the conduction system and the exogenous nerve supply. Thus it is seen that digitalis may affect the heart rate by: effect on the myocardium (direct); effect on the conduction system, direct and by reflex; or by effect on the exogenous nerve supply, (principally vagus), direct and by reflex.

Extrasystoles (premature contractions), as previously stated are probably due to the hyperirritability of the ventricular myocardium. This is the most frequent type of arryhthmia and is not a contraindication to continued administration of digitalis. The premature contractions are frequently auricular, but this does not change the prognosis. This arrhythmia is one of the earliest signs of toxicity and usually begins with an isolated extrasystole. As toxicity increases the extrasystoles become multiple and regular. Further toxicity changes them to multiple irregular extrasystoles. Zwillinger states that an intracardial injection of magnesium sulfate (10 c.c. of 15 per cent solution) will stop extrasystoles of either auricular or ventricular origin. This procedure may be advantageous in cases where cessation of digitalis is undesirable. Magnesium sulfate may also be used in paroxysmal tachycardia, but fails to stop auricular flutter or fibrillation.

Sinus arrhythmia, in the absence of associated arrhythmias, is one of the earliest of the arrhythmias noticed. It is due to the stimulation of the vagus nerve. Sinus arrhythmia may be abolished by the administration of atropine. Its development is not an indication for the discontinuance of digitalis.

Auricular fibrillation is thought to be due to the direct action of digitalis on the conduction tissue. The exact mechanism of its initiation is not known. It may be reflex in origin, a too rapid restoration of mechanical efficiency. Auricular fibrillation is usually preceded by the presence of regular auricular premature beats, and may appear with or without other signs of toxicity. Opinion is varied as to whether the onset of this arrhythmia indicates the discontinuance of the drug. Actually, it depends on the relative insufficiency of the patient at that time, and on whether or not the physician thinks the patient is able to compensate fully enough to allow the withdrawal of digitalis. The fibrillation will usually disappear on the withdrawal of the drug. If precipitation into auricular fibrillation is associated with other signs of toxicity, discontinuance of digitalis is indicated. Schwartz warns that one must be particularly careful in administration of digitalis to children with an active rheumatic carditis.

Pulsus bigeminus is a comparatively early sign of toxicity. It occurs with increased frequency in patients with auricular fibrillation (either originating in congestive heart failure or from digitalis), patients under 40 years of age, and patients with rheumatic heart disease. Most patients receiving digitalis and with auricular fibrillation have premature ventricular systoles at the same time, though this arrhythmia is masked clinically. When the extrasystoles are forceful enough to open up the semilunar valves and occur regularly one after each normal systole, one obtains this pulsus bigeminus.

In approximately 40 per cent of the

cases 4 mg. of atropine subcutaneously will either abolish the arrhythmia or decrease it. The action of atropine in this instance is on the vagus, but the reason for the disappearance of the arrhythmia has not been clearly shown. If the arrhythmia does not respond to atropine, discontinuance or a decreased dosage of digitalis is indicated. Duration of the arrhythmia after withdrawal of the drug varies and is in direct relation with the severity of the heart disease. The presence of pulsus bigeminus decreases the prognosis but probably only because it appears in patients with more severe heart disease.

There are arrhythmias associated with delayed AV conduction which are due to digitalis in toxic doses. The digitalis decreases AV conduction by two methods: (1) vagal and (2) direct action—increased contraction results in an increased refractory period which in turn results in decreased conduction of the initiated auricular impulse. Depression of conduction through the node or bundle varies with the degree of digitalis intoxication. It may be divided into three stages:

1. Delayed conduction: In this stage, every impulse gets through but the intervals between auricular and ventricular systoles are lengthened. This is evidenced by an increased PR interval in the electrocardiogram.

2. Partial heart block: In this stage, impulses from time to time fail to reach the ventricle and a beat is missed. Auricular beats are regular and ventricular beats are missed, irregularly at first. Soon the dropping of beats becomes regular or remains i r r e g u l a r, so an auriculo-ventricular rhythm becomes established in which the two chambers beat in the ratio of 2:1, 3:1, or 4:1.

3. Complete heart block: When the AV node or bundle offers an absolute barrier to the passage of the impulse, the dissociation of the rhythms of the two ventricles is complete. The auricle beats at its own rate of about 70 per minute, and the ventricle at its inherent rate of about 35. This is the idioventricular rhythm, and is apparently due to a change in the location of the pacemaker.

This AV dissociation frequently leads to ventricular fibrillation which is apparently the cause of death in over-digitalized patients.

Heart block is not a prominent feature of toxic action of digitalis even though impairment of AV conduction usually appears at the dosage associated with therapeutic effects. Reid, in his paper, "The Bogy of Heart Block in Digitalis Therapy," states that there are no records of patients dying solely as a result of digitalis induced heart block. Quite a lot has been written concerning the point of AV delay at which digitalis should be stopped or at least decreased in dosage. Most authors used to believe that when the ventricular rate drops to 60 beats per minute, digitalis should be stopped. But, in view of the statement that heart block does not apparently result in death of the patient, it would seem that heart block is not a contraindication to continued digitalis therapy. Since most of the patients with heart block are also in severe heart failure, it is evident that if digitalis is stopped simply for heart block, quite a few will die from congestive heart failure.

Schwartz, in a review of this problem, states that digitalis in therapeutic doses may be of great benefit to patients with complete block and heart failure. The improvement in these patients takes place through direct action of digitalis on the heart muscle and not through an acceleration of the automatic beating ventricles. The ventricular rate is increased appreciably only after administration of digitalis in doses larger than those commonly employed in therapeutics. An increase in ventricular rate in complete block during administration of digitalis is a toxic manifestation, and, because of its undesirable effects, calls for its immediate withdrawal. Since it is difficult to appreciate the various types of toxic rhythms that manifest themselves in complete heart block during digitalis, it is advisable to prescribe the drug to such patients under careful graphic con-

trol. Groedel warns that any exercise in patients with a AV delay resulting from digitalis may convert the delay to heart block.

Auricular tachycardia is an arrhythmia that is not usually demonstrable clinically. No statistics have been published on its incidence, but many authors believe that it frequently precedes auricular fibrillation. This arrhythmia has its origin in an ectopic focus in the auricular muscle. Infrequently it may have its origin in the SA node. Auricular tachycardia is not a contraindication to continuance of digitalis therapy.

Ventricular tachycardia is an arrhythmia that has its origin in an ectopic focus in the ventricular muscle. Infrequently it may have its origin in the AV node or AV bundle. It may be either direct or reflex in origin. The occurrence of this arrhythmia is another reason why digitalis therapy involving any rhythmic changes should be closely followed by a graphic method. Electrocardiographic evidence of this arrhythmia, particularly if the QRS complex is changed in direction, should indicate immediate cessation of the drug since this arrhythmia frequently leads to ventricular fibrillation.

Auricular standstill is an arrhythmia that results from a severe SA block. Probably it is a result of the direct action of digitalis in large toxic doses. This arrhythmia is an indication for at least a decrease in the digitalis dosage. If the standstill is not broken by decreasing the dosage, the digitalis should be stopped. The prognosis is definitely decreased by the appearance of this arrhythmia, probably because it is associated only with a severe form of toxicity.

Paroxysmal tachycardia of auricular origin is a comparatively infrequent arrhythmia believed to consist of a series of rapidly recurring extrasystoles which completely submerge the physiologic rhythm. The electrocardiogram shows complete complexes, occurring at rates of 120-250 per minute. This paroxysmal tachycardia occurs most frequently after middle life, and occurs at a low toxic level of digitalis. Frequently there are not associated toxic symptoms. Continuation of digitalis is not particularly contraindicated.

Paroxysmal tachycardia of venticular origin may have its origin in the AV node, stem of the bundle, or in the ventricle itself. When the impulses arise in the AV node or supraventricular part of the bundle, the PR intervals are shortened. Inversion of the P waves is common. Also the contraction of the ventricles may be simultaneous with that of the auricles, and the P wave will be buried in the QRS complex. Many variations of the electrocardiogram are seen in this arrhythmia. There is an increased incidence of this arrhythmia in the presence of auricular fibrillation. Recently several cases have been reported in which paroxysms consist of regular alternation of upward and downward ventricular complexes, probably due to ectopic beats arising alternately in the right and left ventricular muscle.

In general it may be stated that any increase in the heart rate without obvious physiologic cause in a patient who is receiving digitalis, or any apparent failure of digitalis to slow the fibrillating heart should be regarded with suspicion. In proven cases of paroxysmal ventricular tachycardia, digitalis should be stopped immediately due to the imminent danger of precipitating the heart into ventricular fibrillation.

Ventricular fibrillation is the end point of digitalis toxicity, since it is stated that most over-digitalized patients who die do so as a result of this arrhythmia. Every care must be taken to avoid this arrhythmia. It is usually preceded by other types of toxic rhythms as indicated above, during which digitalis should be stopped or the dosage decreased. Schwartz and Jezer state that there are some patients who, while in congestive heart failure, seem predisposed to the development of this arrhythmia. These patients are usually over 60 years old, have had clinical evidence of heart disease for 10 years, and have had at least two episodes of congestive heart failure. When this arrhythmia occurs immedi-

ate cessation of digitalis is indicated. One method suggested for resuscitation of the fibrillating heart is the injection of 0.5 per cent solution of potassium chloride into the carotid arteries so that some gets into the coronary artery. One or two minutes later a .023 per cent solution of calcium chloride is introduced by the same route to restore the heart to normal rhythm.

Other arrhythmias have been reported, but those not here discussed are comparatively rare. Examples are pulsus alternans, phasic irregularity.

### EFFECTS OF DIGITALIS DEPENDENT ON RESTORATION OF CARDIAC EFFICIENCY

The normal effect of digitalis on the cardiac output is determined by the heart rate, the heart size, the stroke volume, velocity of the blood flow, peripheral resistance, and venous return. In normal hearts, the venous return is adequate, the peripheral resistance is approximately normal and the heart rate is comparatively unaffected by digitalis. Thus the heart is at maximum efficiency and is maintaining normal output. However, due to digitalis, the capacity of the ventricles is reduced due to the direct cardiotonic action. This in turn results in a decreased stroke volume and decreased cardiac output. The decompensated heart is usually dilated and mechanically inefficient. Due to the direct cardiotonic action, the heart is returned to the normal maximum efficiency. Stroke volume is increased and the normal cardiac output is attained.

In passing, one may say that the good effects of digitalis may be offset if any toxic arrhythmia is induced. In short, restoration of maximum cardiac efficiency is possible only with therapeutic drug levels. The normal effect of digitalis on the venous pressure, in general, is that the pressure is reduced due to the increased cardiac output. As explained above, any toxic arrhythmia interfering with the cardiac output may result in an increased venous pressure.

Congestive heart failure increases the circulatory volume. Digitalis, by restoring the normal cardiac output, decreases the circulatory volume. These findings correlate with the recent reports in which McGuire, Johnson and Calvus stated that in patients with congestive heart failure in whom 70-80 per cent of the calculated minimal lethal dose of digitalis was accidently administered with the resulting toxic arrhythmias, the congestive heart failure was not alleviated, but in some cases actually increased.

### EFFECT OF DIGITALIS ON BLOOD PRESSURE

Comparatively little work has been done on this point. Effects on the normal blood pressure are highly variable and so far, no toxic effects have been recorded. In general the following effects may be expected: no significant change in a normal person; in patients in congestive heart failure, an increase if originally low, and a decrease if originally high.

### EFFECT OF DIGITALIS ON CORONARY CIRCULATION

Literature is very controversial concerning this subject. However, it is generally believed that digitalis in therapeutic doses has no effect on the coronaries. This belief is fairly well substantiated by the recent work of Dearing, Barnes and Essex who, after experimenting with approximately 20 cats, state that the calculated therapeutic doses produced no appreciable change in the coronary flow.

Further work by Dearing, Barnes, and Essex revealed that calculated toxic doses of digitalis resulted, a definitely decreased coronary flow which occurred from four to six hours after administration of the drug, and which persisted for several days after discontinuance of the drug. There was no correlation between the decreased coronary flow and changes in the pulse rate or blood pressure. Fenn and Gilbert state that digitalis is capable of producing anginal pain by constriction of the coronary arteries, but this does not happen in every case, nor can it be predicted in any case. In conclusion, it may be said that there is indication that coronary flow is reduced by over-digitalization, but that until further comfirmatory work is done, no definite statement can be made.

ELECTROCARDIOGRAPHIC EFFECTS

Changes in the T wave are shown early on the electrocardiogram of a digitalized patient. The amplitude is decreased, flattened, and finally inverted. $T_1$ is inverted and $T_3$ retroverted, or the opposite. Dearing estimates that a calculated 20-30 per cent minimal lethal dose (which is a therapeutic level) will bring about changes in the RST segment. There is usually a depression of the RST segment which is due to direct action on the muscle and is not abolished by atropine. Later the prolongation of the PR interval occurs. It may be either vagal or direct in origin. There is also a shortening of the QT interval due to decreased duration of ventricular systole. It must be emphasized that these changes are frequently absent and can not be used as a quantitative estimation of the digitalis level. There are unusual electrocardiographic changes present due to the toxic arrhythmias which will not be described here.

EFFECTS OF DIGITALIS ON THE GASTROINTESTINAL TRACT

Oral digitalis is adequately absorbed by the intestinal tract under nearly all circumstances, including chronic passive congestion of the enteric mucosa due to congestive heart failure. Local irritation is apparent even when the drug is taken with meals to avoid this action. The drug is adequately absorbed within two hours, and exerts full action on the heart within six hours. Digitalis in therapeutic doses exerts no abnormal toxic effects.

The toxic manifestations of digitalis on the gastrointestinal tract are: anorexia, nausea, vomiting, diarrhea, increased salivation, and abdominal discomfort and pain. All of these manifestations are apparently reflex in origin, with the possible exception of diarrhea. They occur equally as much with intravenous administration as with oral administration. Experiments with gastrectomized animals reveal that the same toxic symptoms occur.

Anorexia is probably the earliest sign of approaching tolerance in the administration of digitalis. It occurs one to two days before nausea and vomiting (that is, if the dosage is increased), and persists until the digitalis is reduced in dosage, or at times, until it is stopped completely. Anorexia is not an indication for discontinuance of digitalis, but is an indication that tolerance is being approached and that dosage can not be increased much further without the appearance of other toxic symptoms.

Nausea and vomiting may be considered together as they are apparently due to the same mechanism. Nausea is an early indication of toxicity and tends to appear in recurring waves. Vomiting occurs after the onset of nausea and is variable in duration and in amount. Both symptoms have been proved not to be due to local irritation of the gastrointestinal tract. Rather it has been shown that they are due to the stimulation of a medullary emetic center. These stimuli apparently come directly from the over-digitalized heart and are carried mainly by the sympathetics, and possibly the vagus.

Repeated doses of digitalis may depress the vomiting reflex while simultaneously increasing the intensity of the cardiac poisoning so that after an initial period of vomiting, the continued administration of these drugs may fail to produce emesis, and even cause death without further vomiting. These experimental results suggest the need of caution in relying on nausea and vomiting as measures of the degree of cardiac poisoning in the clinical use of digitalis. The most probable explanation of the change in response of the vomiting reflex appears to be that doses of digitalis may continue to increase the cardiac poisoning while at the same time directly depressing the vomiting reflex.

Very little work has been done on the subject of increased salivation as a phase of digitalis poisoning. It is a comparatively early sign of toxicity and is apparently due to a sympathetic stimulus set up by the over-digitalized heart. Its clinical significance cannot be evaluated at the present.

Diarrhea is a comparatively infrequent manifestation of digitalis toxicity. It has been suggested that the diarrhea is due to an increased emptying time of the stomach

as a result of the local irritation of the gastric mucosa. It has also been suggested that the diarrhea may be the result of the changing fluid balance which occurs when the heart is recompensating and congestive failure is being done away with. Diarrhea may occur at any level of toxicity and is not an indication of any change in digitalis dosage.

Abdominal discomfort and pain are manifestations that also are fairly rare. At the present, no explanation of their mechanism is available and their clinical significance can not be properly evaluated.

CEREBRAL EFFECTS OF DIGITALIS

The effects of digitalis on the central nervous system may be divided into three main parts; the reflex stimulation of the medullary vomiting center as explained previously; the general effects on the central nervous system; and the so-called digitalis delirium.

The general effects on the central nervous system are present even in patients who have received a calculated therapeutic dosage of digitalis, but perhaps are intensified with toxic dosages. Many effects have been listed. Some are headache, fatigue, malaise, drowsiness, excitement, restlessness, increased iritability, nervousness, inability to think, and languor. None of these symptoms are an indication for discontinuance of digitalis unless they reach such a point that the physician thinks they are interfering with the convalescence of the patient.

The mechanism causing the general cerebral effects is not clearly understood. The headache is general in distribution, is not particularly severe and seems to increase as the patient becomes recompensated. It has been suggested that not only the headache, but the other symptoms as well may be due to the changing fluid balance which results from recompensation of the heart. It has also been suggested that the headache is due to a reflex cerebral vasoconstriction caused by the varied increase in cardiac output of the digitalized heart, or perhaps caused by actual sympathetic impulses originating in the decompensating heart.

The question of digitalis delirium is even more clouded. Probably most physicians follow the teachings of Weiss, who states—"In the psychosis which occurs after the administration of digitalis, we are dealing with a cerebral circulation which is *a priori* abnormal due to chronic sclerotic vascular changes or to circulatory changes. If sudden general circulatory changes are produced through digitalis or rest, a psychosis develops because of sudden changes in the cerebral circulation and because of the physicochemical change associated with the removal of large amounts of edema. Whether the entrance of toxic chemical decomposition products of the body or other chemical changes are responsible for the psychosis we are unable to say at the present." This is certainly a very tenable explanation, since it has been shown that in 97 per cent of the reported cases the patient has been over 50 years of age and has had advanced generalized arteriosclerosis.

Again, however, we are brought face to face with the new evidence accumulated by Dearing in his experiments with the histopathologic changes of digitalis toxicity in cats. Dearing found that:

1. Thirty per cent of calculated minimal lethal dose (the therapeutic dosage) either in rapid digitalization, or maintenance dosage did not result in any tissue changes.

2. Sixty per cent of the calculated minimal lethal dose was the smallest dosage to give tissue changes. The changes increased with increased dosage and did not occur until after six or seven doses.

3. Changes affected the large and small pyramidal cells of the cerebral cortex and consisted of the following: swelling of the cell body, vacuolization of the cytoplasm, varying grades of cytoplasmic and nuclear degeneration, complete liquefaction of the cells, pyknosis of the cells, complete cell degeneration with following satellosis. This reaction varied from focal to diffuse in location. If the animal recovered, the lesions disappeared in three to four weeks.

So if, as Dearing suggests, the actions of digitalis in the cat are analogous with its action in the human, there is a much firmer

basis on which to explain the cerebral symptoms. One must also remember the older explanation of change in cerebral fluid balances.

In digitalis d e l i r i u m the following symptoms may be seen: disorientation, particularly of time and place; confusion; actual delirium, progressing to stupor; illusions and hallucinations; temporary aphasia (apparently motor in type); temporary impairment of memory; and rarely convulsions. Carr states that to reach a diagnosis of toxic digitalis delirium, one must satisfy the following standards: (1) absence of other causes of delirium; (2) presence of other toxic symptoms; (3) onset of delirium as decompensation recedes; (4) previous administration of a large amount of the drug; (5) rapid clearing of the symptoms when digitalis is withdrawn, and (6) reappearence of the same symptoms when digitalis is readministered. In the event of diagnosed digitalis delirium the following steps are recommended by Smith as the proper treatment. After recognition, discontinuance of digitalis, then an increased fluid intake and restraint. Under this regime, Smith states that 90 per cent of the patients will recover within four to six days.

EFFECTS ON VISION

Many effects on vision have been noted and recorded as being due to toxic doses of digitalis. Some of these are halo vision, color vision, diplopia, bizarre varieties of light sensation, inability to focus eyes, "angle" vision, oscillation of objects, temporary blindness. Objectively, little has been found. Ophthalmoscopic examination has been repeatedly negative. Various other findings have been reported in isolated cases, mild conjunctivitis with peripheral corneal injection, and uneven dilatation of pupils. Exophthalmos and even nystagmus have been reported.

There is no constancy in the time of the appearance of these symptoms. The milder symptoms usually appear early in the digitalis course. The milder symptoms most frequently manifest are the bizarre varieties of light sensation and scotoma. Among these varieties are flickering, flashing, blurring of vision, amblyopia, and all types of spots and sparks. Diplopia and inability to focus the eyes are probably the next most common symptoms. Halo vision and color vision are relatively infrequent. Color vision has been reported as being white, green, lavender, red, blue and most frequently yellow. It may be partial, in spots, general, transitional, or of variable intensity. It must be remembered that color vision may be due to other factors; that is, yellow vision may be due to cannabis indica, amyl nitrite, and picric acid poisoning.

The other visional aberrations are comparatively rare and of no practical clinical significance. Unless the above symptoms are accompanied by other signs of toxicity there is no indication for cessation of digitalis administration.

Several mechanisms have been suggested as the causal agent for these symptoms. Jackson has suggested that the color vision is due to action of digitalis on the tensor choroidae and dilatation of the vessels of the iris. Actually, it has been found that the vesseis of the iris are dilated more than usual during these visual episodes. Weiss has suggested that colored vision and perhaps the other visual manifestations may be the result of spreading of excitation waves from the vagus center to the visual centers of the mid and hind brain.

EOSINOPHILIA

This is a relatively rare manifestation of digitalis toxicity. Few substantiated cases have been reported, and the eosinophilia has varied from 6 to 30 per cent. In order to be classified as a digitalis eosinophilia, the eosinophilia must not be pre-existent of the administration of the digitalis; there must be a noticeable increase within 12-18 hours after administration of the drug; there should be a decrease in eosinophilia within two days after cessation of the digitalis. There is some evidence that this eosinophilia is the result of vagus stimulation by digitalis. It is fairly well clinically accepted that direct vagus stimulation may result in an eosinophilia which is abolished by atropine, and increased by pilocarpine. Since, writers have reported that the digitalis induced eosinophilia has been abolished by atropine. This phenomenon has

no proved clinical significance and its appearance does not affect the digitalis dosage used.

ALLERGIC EFFECTS

This is one of the more rare manifestations of digitalis administration. It perhaps should not be considered as a true toxic manifestation since it occurs even on initial dosage of digitalis and is due neither to an initial massive dose, nor to a cumulative effect of digitalis. A typical allergic picture evolves. The patient has fever, general pruritis, urticaria, joint involvement, edema of the face, and rarely an eczematoid reaction. There is no change in pulse rate or blood pressure. The skin test is negative as with all other drug allergies. Digitalis allergy is diagnosed on the history, objective findings and results of administration and withdrawal.

MISCELLANEOUS EFFECTS

General muscular weakness is an effect of digitalis toxicity that has been reported several times. It is rather an unusual manifestation and shows some variation in the time of its appearance. It has no particular clinical significance and its appearance does not indicate cessation of the administration of digitalis. Neurologic examination is normal in every respect and muscle strength returns in approximately four days after discontinuance of the drug.

There have been various case reports in which embolism has been blamed on the administration of digitalis. The mechanism of this is probably due to the transition of the arrhythmia from auricular fibrillation to less toxic rhythms. This results in the shaking loose of any mural thrombus that has been formed. Fortunately comparatively few cases have been reported in which the embolism can be directly traced as a result of administration of digitalis. This phenomenon results from the administration of therapeutic doses of digitalis and there is no particular clinical indication that it is going to happen.

As previously stated, digitalis has comparatively disappointing effects in the congestive heart failure with hyperthyroidism as an etiology. In regard to the accentuation or decentuation of toxic effects of digitalis in these states, it has been more or less proved that there is no significant difference in the response.

Many authors have warned that calcium should never be administered during digitalis therapy due to its synergism with digitalis. However, Smith and Hoft after a series of conclusive experiments have stated that the lethal effects of calcium and digitalis are neither synergistic nor even completely additive. The only danger of injection of calcium with digitalis is its early inherent toxic action on the heart muscle.

Many cases have been reported in which digitalis was administered to patients with congestive heart failure and edema. No effect was noticed until the edema began to subside and then toxic effects seem to be precipitated all at once. This effect has been proved to be due to the fact that digitalis has a tendency to accumulate in the edema fluid and when the edema subsides, the digitalis is released in toxic doses.

SUGGESTIONS FOR AVOIDANCE OF TOXIC EFFECTS

The first point that one must consider is whether or not digitalis is actually indicated in the case. The indications for administration have been listed above. Actually, the contraindications for digitalis therapy is the lack of indication. Ashburn has outlined the following points as the common misusages of digitalis: to slow heart in simple tachycardia of nervous origin (effort syndrone or goiter), or toxic origin (diphtheria, rheumatic fever, pneumonia); paroxysmal tachycardia; valvular and other abnormalities, with possible exception of mitral stenosis, unless there is myocardial insufficiency; quantity *per se* of the dose (too small a dosage, too large a dosage).

The following list may be used generally as indication for the discontinuance of digitalis, or at least its reduction. Of course it must be tempered by the judgment of the physician. (1) Severe and increasing nausea and vomiting; (2) any change in regular rhythm to an arrhythmia, particularly sudden slowing of the cardiac rate, slowing of the cardiac rate to 60 or below, any evidence of an increasingly delayed AV conduction, or changing of extrasystoles to

pulsus bigeminus; (3) headaches, dizziness or disturbed vision, together with other toxic symptoms.

In closing, it should be said that with the appearance of so many new digitalis drugs and derivatives on the market today, it becomes increasingly necessary for the physician to select one dependable preparation and to limit his experience to this one preparation. He should make every effort to understand this preparation thoroughly; its variability, its limitations, its eccentricities and most important of all its therapeutic and toxic ranges.

## SUMMARY AND CONCLUSIONS

In this paper, the various toxic manifestations of digitalis have been presented—as they affect the cardiovascular system, the gastrointestinal system, the central nervous system, and other bizarre manifestations. An attempt has been made to explain the mechanisms behind these different toxic effects so that the practitioner may understand the physiologic basis of these effects instead of learning them by memory. In view of the world wide use of digitalis, it is apparent that the up to date physician must know the limitation of this extremely valuable but relatively dangerous drug. It is hoped that this paper will help to give the doctor a more thorough understanding of the action of digitalis and in particular the danger signs of its toxicity.

## BIBLIOGRAPHY

Ashburn, C. W.: The use and abuse of digitalis, South. M. & S., 94:719, 1932.

Bastedo, W. A.: Digitalis hypersusceptibility and dosage. M. Clinic N. A., 9:575, 1925.

Brandt, R.: Eczema as a result of hypersensitivity to digitalis purpura, Wein. Klin. Wchnschr., 50:1525, 1937.

Carr, J. G.: Digitalis delirium, M. Clin. N. A., 9:1391, 1926.

Idem: Toxic effects of digitalis, J. A. M. A., 81:435, 1923.

Caviness, V. S.: Auricular standstill, Am. Heart J., 25:128, 1943.

Chamberlain, E. C.: Digitalis poisoning, J. Florida M. A., 28:586, 1942.

Christian, H. A.: The pharmacology of digitalis in relation to therapy of heart disease, New England J. M., 208:66, 1933.

Cohen, R. V., and Brodsky, M. I.: Allergy to digitalis, J. Allergy, 12:69, 1940.

Cushing, A.: The Actions and Uses in Medicine of Digitalis and Its Allies. London, 1925, Longman's, Green & Co.

Dearing, W. H., Barnes, A. R., Essex, H. E.: Experiments with calculated therapeutic and toxic doses of digitalis, Am. Heart J., 25:648, 25:665, 25:719, 25:734, 1943.

Dresbach, M.: Additional experiments relative to the origin of glycoside emesis, Am. J. Physiol., 126:480, 1942.

Dry, T. J.: Usual manifestations of digitalis intoxication, Proc. Staff Meet. Mayo Clinic, 13:575, 1938.

Fenn, A. K., and Gilbert, N. G.: Anginal pain as a result of digitalis, Ann. Int. Med., 5:858, 1932.

Gold, H., and Degraff, A. C.: Newer systems of administration of digitalis, J. A. M. A., 119:928, 1942.

Gold, H., and Otto, H. L.: Clinical study of digitalis bigeminy, Am. Heart. J., 1:471, 1926.

Gold, H., Travel, J., and Knit, N.: Depression of vomiting reflex by digitalis bodies, Am. Heart J., 7:165, 1931

Goodman L., and Gilman, A.: Pharmocological Basis of Therapeutics, New York, 1943, Macmillan and Co.

Gouley, B. A., and Sologg, L.: Use of quinidine in treatment of arrhythmias and tachycardias caused by digitalis intoxication, Am. Heart J., 16:561, 1938.

Groedel, F.: Exercise test in digitalis block, Exper. Med. & Surg., 1:380, 1943.

Gruber, C. M., Haury, V. G., Drake, M. E.: Toxicity of digitalis and ouabain in animals under sodium thiopentobarbitol and sodium pentobarbital anesthesia, Am. Heart J., 20:329, 1940.

Haag, H. B.: The pharmacology of digitalis, Virginia Med. Monthly, 60:331, 1933.

Hahn, R. G., and Rosenblum, H.: Minimal toxic and lethal dosage of digitalis in experimental hyper and hypothyroidism, Am. Heart J., 8:235, 1932.

Hatcher, P. A., and Weiss, S.: Seat of emetic action of digitalis bodiee, Arch. Int. Med., 29:690, 1942.

Heyl, A. F.: Paroxysmal auricular tachycardia caused by digitalis, Ann. Int. Med., 5:858, 1932.

Jackson, H., and Zerfas, L. G.: A case of yellow vision associated with digitalis poisoning, Boston M. & S. J., 192:890, 1925.

Jezer, A., and Schwartz, S. P.: Auricular fibrillation as an early manifestation of digitalis toxicity, J. Pediat., 5:811, 1934.

LaDue, J. S.: General muscular weakness as a toxic reaction of digitalis, Proc. Soc. Exper. Biol. & Med., 48:5, 1941.

Luten, D.: Toxic rhythms from digitalis, Arch. Int. Med., 35:87, 1925.

Luten, D.: Advanced toxic rhythms from digitalis, Arch. Int. Med., 35:74, 1925.

Massey, L. W., and Steiner, P.: Peripheral embolism after digitalis therapy, Lancet, 1:245, 1944.

Marvin, H. M.: Paroxysmal ventricular tachycardia with alternating complexes due to digitalis intoxication, Am. Heart J., 4:21, 1928.

McGuire, Johnson, and Calvus, E.: Fatal digitalis poisoning occurring in a normal individual, Amer. Heart J., 12:109, 1936.

Moench, G. L.: Effects of digitalis on nervous systems, M. J. & Rec., 130:381, 1929.

Muhler, H. K.: Digitalis, M. Clinic N. A., 8:913, 1924.

Pearson, G. W.: Visual and cerebral manifestations of digitalis administration, J. A. M. A., 98:99, 1932.

Reid, W. D.: The bogy of heart block in digitalis therapy, J. A. M. A., 93:26, 1929.

Idem: Some toxic effects of digitalis, J. A. M. A., 81:435, 1923.

Roberts, W. H.: Visual disturbances with digitalis medication, New England M. J., 213:248, 1935.

Romano, J., and Geiger, A.: Digitalis eosinophilia, Am. Heart J., 11:742, 1936.

Rosenbaum, F. F., and Levine, S. A.: Auricular standstill, Am. J. Med. Sci., 198:774, 1939.

Schwartz, S. P., and Jezer, A.: Effects of digitalis bodies on patients with transient ventricular fibrillation, Am. Heart J., 16:463, 1938.

Schwartz, S. P.: Action of digitalis in complete heart block, Am. Heart J., 4:418, 1929.

Idem: Digitalis studies on children with heart disease, Am. J. Dis. Chil., 39:549, 1930.

Smith, A. E., and Benner, S. R.: Eosinophilia due to administration of digitalis, Am. Heart J., 7:182, 1931.

Smith, H. L.: Cerebral manifestation of digitalis intoxication, Proc. Staff Meet. Mayo Clinic, 13:573, 1938.

Smith, P. K., and Hoft, H. H.: Calcium and digitalis synergism, Arch. Int. Med., 64:322, 1939.

Sprague, A., White, M., and Kellog, C.: Disturbances of vision due to digitalis, J. A. M. A., 85:716, 1925.

Tung, C. L.: Transient auricular fibrillation due to digitalis, Am. Heart J., 12:272, 1936.

Weiss, S.: Effects of digitalis bodies on nervous symptoms, M. Clin. N. A., 15:963 ,1932.

Willius, F. A.: Digitalis, its rational use, Ann. Int. Med., 11:1084, 1938.

Zwillinger, L.: Effect of magnesium on the heart, Klin. Wchnschr., 14:1429, 1935.

## INFECTION OF THE MOUTH AND PHARYNX

### A REPORT OF 98 CASES

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A discussion of certain infections with resulting abscess formation in the soft tissues that make up the walls of the mouth and pharynx should be of interest to the general practitioner, the internist, as well as the head and neck specialist, for any of these may be summoned to see such a patient. As long as there exists infected tonsils, infected teeth, and infected ears, from time to time there will develop extensions of these infections into the deeper structures of the neck. This involvement always occurs as a secondary affection, yet it is of primary importance.

Ther are four types of abscess formation to be considered. They are peritonsillar, perialveolar, parapharyngeal, and lastly, retropharyngeal abscess. The perialveolar abscess may progress into Ludwig's angina if in the lower jaw or develop into a palatal or buccal phlegmon if in the upper jaw.

The fascial planes of the neck serve as distinct natural barriers when infection does develop. It is of paramount importance to keep this in mind because too eager or ill-advised surgical interference increases the rapidity of the extension and therefore delays localization or resolution. The word "space" has come into use in referring to certain areas that become sites of abscess formation. "Spaces", as is known, do not exist as such in the neck, but rather the abscess itself creates this space by destroying the soft areolar tissue and pushing aside the muscles and ensheathed blood vessels and nerves. Almost any site might conceivably become infected, but experience has shown that certain sites are more susceptible.

A review of the records of patients in the Oak Ridge (Tennessee) Hospital and Clinic* for a two-year period from December 1, 1943, to December 1, 1945, revealed a series of case histories of 98 such patients who fell into this category. There were 66 cases of peritonsillar abscess, 26 with perialveolar abscess, five with parapharyngeal abscess, and one with retropharyngeal abscess. It became apparent from a review of this series that while most of these patients were acutely ill upon admission, almost all responded rapidly to treatment. Certainly one did not observe any of the complications which have been known to develop when abscess exists in these locations. From peritonsillar abscess, a parapharyngeal abscess may develop. There may occur a thrombophlebitis of a neighboring vein, and subsequently a fatal septicemia may ensue as a result of a parapharyngeal abscess. Cases of fatal hemorrhage have been reported that were due to an erosion of an artery. One patient who was admitted to the hospital with a subacute mastoiditis was found upon examination to have had a complete loss of his upper palate on one side. This had resulted from an infection arising from an abscessed upper molar tooth which progressed into a phlegmon and osteomyelitis of the entire upper jaw of that side. Unfortunately it had occurred before the advent of sulfonamides. Retropharyngeal abscess has been known to extend downward and cause a diffuse mediastinitis; it may cause such severe dyspnea by edema of the glottis that a tracheotomy is necessary, or it may rupture spontaneously and fill the respiratory tract to suffocate the patient.

#### PERITONSILLAR ABSCESS—SIXTY-SIX CASES

This type of abscess, commonly known

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as "quinsy" is usually an excruciatingly painful condition, and fortunately is the most easily managed of the four types of abscess formation. In this group there were two patients who were 8 years of age and there were four over 50. An attack of acute tonsillitis preceded the onset of the abscess. In two patients, tonsillectomy had been done many years earlier but some tonsil tissue still existed. One of these had but a small but painful abscess formation which gave relief when incised. The second, who likewise gave a history of a tonsillectomy some years earlier, stated that the physician had had some operative difficulty with the presently involved side. Upon close inspection, a portion of the upper pole of the tonsil could be seen bound down by dense scar tissue and overlying this was a very red and tense entire soft palate and peritonsillar area. Even though a generous incision was made, purulent exudate did not exude until a curved hemostate was inserted deeply and then opened. In 53 of the patients, the peritonsillar abscess was incised at the initial visit; however, 22 of these patients had such severe systemic symptoms of marked pharyngeal involvement that it was felt hospitalization was indicated.

Treatment consisted of hot saline throat irrigations (not a gargle) given every one or two hours along with which one of the sulfonamides or penicillin was administered. In 18 of the 22 hospitalized patients, it was deemed advisable to respread the primary incision to permit drainage of accumulated exudate. Recovery occurred in from three to five days. One patient, in spite of hospitalization for a severe follicular tonsillitis and treatment with throat irrigations and sulfonamides, developed a bilateral peritonsillar abscess. When the patient was seen originally in consultation on the eighth day, the tonsils appeared very large and the peritonsillar tissue and soft palate appeared very swollen. It was not realized until the following day that this was a bilateral peritonsillar abscess which existed no doubt before and had not been recognized as such. Incision on each side gave relief and confirmed the tardy diagnosis.

It was customary to request all patients who had the peritonsillar abscess opened in the clinic to return the following day. This was so an opportunity might be afforded to respread the incision if it were necessary. In most instances this procedure did release an additional amount of exudate and permitted a more prompt recovery. No anesthesia, either topical or by infiltration, was used preceding the opening of the peritonsillar abscess. This applied also to the two 8 year old children. A cataract knife is used to make the incision at a point where a horizontal line through the free edge of the soft palate crosses a vertical line just mesial to the base of the anterior tonsillar pillar. Immediately following a long curved hemostat pointing mesially is inserted through the incision and then opened as it traverses the posterior pole of the tonsil. This method has proven more satisfactory than trying to select the point of greatest bulging for incision of the abscess.

PERIALVEOLAR ABSCESS—TWENTY-SIX CASES

As the name would imply, this infection is of dental origin. It may develop from an apical abscess of a tooth, or, it may arise from dental operation on these teeth or from infection pre-existing or developing at the site of fracture of the mandible. In this group there were 14 patients who exhibited sufficient inflammation and edema about the anterior pillar of the tonsil and the lateral side of the tongue to displace the tongue itself well over to the opposite side. Pain and swelling in the sublingual region, stiffness of the jaws to almost complete trismus, and external swelling under the angle of the mandible are the usual findings. It was felt that at least five of the 26 patients would have developed a deeper parapharyngeal involvement if penicillin had not been given. There were six patients who had the disease process develop in the upper molar area. The inflammation extended mesially to involve the soft palate and inferiorly to the inter-alveolar sulcus. Trismus was marked in these patients. Penicillin and intraoral irrigations of hot saline were used to treat these.

There were three cases which could be traced to fracture of the mandible, with concurrent apical dental infection at the site of fracture. One case was so acute that incision and drainage externally was carried out at the initial visit. The other two, who were given penicillin with an appreciable help, also had external drainage. One was by incision and the other developed an external phlegmon which later broke down in three different places.

The remaining 16 of this group were given either sulfonamides or penicillin, or both, in addition to hot saline intraoral irrigations. However, nine had to have the abscessed cavity incised intraorally while the remaining seven subsided without surgical intervention. One patient upon admission had such severe sublingual swelling, displaced tongue and trismus, and dehydration due to dysphagia that it was necessary to give intravenous dextrose and saline, in addition to penicillin. Yet recovery occurred in five days without surgical intervention.

In this same group of 26 patients, only two had had dental operations, that is, extractions. In other words, infection had pre-existed in the molar teeth and extractions were done for relief. One patient had had infection in both the first and second molars which were extracted. Trismus and marked swelling developed but recovery was prompt after sulfonamides were given. The second patient did not fare so well. Three days following an extraction for the one of three infected lower molars the x-rays of which showed adjacent bone absorption, a marked submandibular swelling developed in addition to swelling and induration on the buccal side of the alveolar process. The infection steadily progressed in spite of large doses of penicillin given at three hour intervals day and night for three weeks. For a while it was thought that a massive necrosis of that portion of the mandible was going to develop. Finally, however, signs of localization became evident. The submandibular swelling receded but the perialveolar and buccal swelling increased. By mandibular nerve root block, an adequate incision was made intraorally over this area which released a small amount of purulent exudate. This procedure was repeated three days later with more satisfactory results and again a week later with subsequent distinct improvement. Numerous small bone sequestra were given off at intervals from the tooth socket as well as through the incised area. The patient ultimately made a recovery although it was protracted.

PARAPHARYNGEAL ABSCESS—FIVE CASES

The usual site of entrance of infection to form a parapharyngeal abscess is just lateral to the tonsillar fossa. It may follow tonsillitis, peritonsillar abscess which is not properly drained, dental infection, dental operations, or tonsillectomy, usually when done under local anesthesia. A patient with a parapharyngeal abscess usually presents marked trismus, pain upon swallowing, and sometimes dyspnea. There is external swelling under the angle of the mandible and on the lateral side of the neck. Intraoral examination reveals a swelling lower and more lateral than the peritonsillar or a perialveolar type of infection. This type of abscess is more potentially serious than the two previous ones because if untreated or unrecognized, it may penetrate to involve the carotid sheath. By virtue of its deepness and being well covered, external fluctuation should never be waited for; it is a late sign. Once the diagnosis is established, it is important to promote drainage and the author feels this can be accomplished in most instances by the intrapharyngeal route. The method employed is to incise vertically the mucous membrane of the tonsillar fossa or, to incise between the tonsil, if present, and the posterior pillar. A long slender curved pointed hemostat is inserted through the incision to a depth of at least one inch and then spread. This method gave adequate drainage. No external incision was needed.

In this group of five patients, tonsillitis was the cause of one, an abscessed lower third molar the cause of the second, and the remaining three developed following exodontia. In fairness to the exodontists, two

of the individuals had severely abscessed molar teeth as well as poor dental hygiene to increase the hazard of extraction by local anesthesia. The third had a severely infected wisdom tooth which was removed under nitrous oxide anesthesia so obviously it could not be ascribed to faulty novocaine injection. All five patients had elevated white blood cell counts, one being over 18,000, fever, marked trismus, and extreme dysphagia. Examination revealed definite inflammation and edema about the entire tonsillar fossa of the involved side. Curiously, the one who had had an attack of tonsillitis showed no especially infected tonsils when first seen. Two of the patients had such marked dysphagia that it was necessary to give glucose and saline solution intravenously to maintain the fluid balance. All five patients received penicillin every three hours which seemed to prove distinctly beneficial. Gentle mouth irrigations of hot saline solution were given at frequent intervals. Intrapharyngeal incision and drainage as described above was done on three of the patients. The abscess ruptured and drained spontaneously in the two patients who had had extractions with novocaine anesthesia. Once drainage was established, the patients made rapid progress. The penicillin was kept up for two more days, however, to hasten recovery. No further complications or sequelae occurred in this group.

RETROPHARYNGEAL ABSCESS—ONE CASE

An acute retropharyngeal abscess occurring in an adult when not secondary to cervical vertebra disease but rather due to infection in the ear and tonsil is unusual. The acute type is usually found in the child of 3 years or younger.

The patient with this affection was a white married female, 27 years of age and six months pregnant. The history brought out that she had had a chronic otitis media for some years and a recent attack of severe tonsillitis. Her chief symptoms were difficulty in swallowing which became progressively worse over a period of eight days, and a sensation of fullness in the back of her throat. Examination revealed a marked midline swelling protruding from the pharynx. She also had considerable apprehension. Her fever was just over 100, white blood cell count 12,600, and x-ray of the soft tissues of the neck confirmed the clinical diagnosis. The abscessed cavity was incised and suction used as it was done. Spot cannula suction into the cavity was used on each of three successive days. Penicillin was given during the entire time of hospitalization and the patient made an uneventful recovery within a week.

SUMMARY

A group of 98 patients with infections in the soft tissues of the neck arising from infection in the mouth and pharynx is discussed.

There were four main groups of abscess development which were individually considered.

Prompt recognition and drainage supported by either sulfonamide or penicillin therapy is important if serious complications are to be avoided.

## SIGMUND FREUD*

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NEW ORLEANS

If we were to travel far to the north in the province of Moravia in what is now Czechoslovakia, we might pass through a small country town, Freiberg, typical of the Austrian village of the nineteenth century. Here in the peaceful pastoral village among the rolling foothills of the Carpathian mountains—half a mile from a dense forest—was born Sigmund Freud. Freud writes: "Meine Eltern waren Juden, auch ich bin Jude geblieben" (My parents were Jews, and I have remained a Jew).

Somewhat off the market place and close to fields and pastures, at 117 Schlossergasse, Jacob Freud lived comfortably with his family in a rather small, two-story house without ornamentation, constructed

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of plastered bricks, with a slate roof. In 1885, Jacob, then over forty years of age, married a second time. His bride, Amalia Nathansohn, was not yet twenty. The following year Sigmund was born.

Sigmund's father's family had settled for a long time on the Rhine, at Cologne, but as a result of the persecution of the Jews during the fourteenth or fifteenth century, they fled eastward, and in the course of the nineteenth century, they migrated back from Lithuania, through Galicia, into German Austria.

At the time of Sigmund's birth Jacob Freud already was a grandfather. Emanuel, the eldest of the two sons of his first marriage—then in his twenties—had a son, John, one year old, and a newborn daughter, Pauline. Thus little Sigmund had a nephew, John, a year older than the uncle. As Freud's development was greatly influenced by the conflicts between the two lads, this peculiar relationship is well worth mentioning.

Like Goethe, who was one of his favorites, Freud came into the world black in color. But whereas in Goethe's case this was due to the cyanosis of impending suffocation, Freud's darkness was due to a covering of black down, so much so that his mother called him "a little blackamoor." Possibly some of his antagonists might find this birth symbolical of the part he was destined to play in the world, a part which they might term satanic. He himself does not seem wholly to deprecate such a charge seeing that the motto he has chosen for his book "Die Traumdeutung" is "Flectere si nequeo superos, Acheronta movebo" (If I cannot influence the Gods of Heaven, I will stir up Acheron). It is interesting to note that three weeks before his birth, a traveling gypsy had told Freud's mother that she was about to give birth to a great man. Subsequently in Vienna, an itinerant fortune-teller informed Sigmund's parents that the boy was destined to become a minister of State, an incredible prospect in the Austria of those days for any one who was not of noble birth. The most remarkable point, however, is that forty years later Freud dreamed of the childish trifle. Using Freud's own basic concepts of dream analysis, it is but a simple deduction to see that the lad's ambition was something quite out of the ordinary.

In Freud's story of his childhood, we learn a good deal about his nurse, Nanny, "that prehistoric old woman." She was very ugly but very clever and efficient, and she often treated him quite unpleasantly. She scolded him bitterly and spanked him when he did not show sufficient appreciation for her standards of cleanliness. Yet he gave her his love and all his pennies. She was sorely missed when she later disappeared—with more than the family's pennies.

We also get a vivid picture of the alternately friendly and hostile relations between the young uncle and his older and stronger nephew, John. They were inseparable. They loved each other and fought each other. Occasionally John was a tyrant who mistreated his younger playmate. But the little uncle had courage and knew how to stave off permanent submission. For years the family remembered the manner in which the two year old retorted when his father called him to account: "Why did you hit John?" "I hit him 'cause he hit me!"

Freud reminisces concerning his relationship with his father. They would go into the "beautiful forest" together; and as soon as the little boy could walk, he would attempt to toddle off on his own. He grew to admire his father as the wisest, wealthiest and most powerful man he knew. One striking incident impressed in Freud's mind is when impelled by sexual curiosity, he intruded into his parents' bedroom only to be driven out by his father's emphatic command.

Although Freud made little mention of his mother in the story of his childhood, there definitely was a mutual, deep attachment between mother and son.

When the boy was three years old, the family moved to Leipzig. A year later, the Freuds settled in Vienna. Here Freud was to spend almost the entirety of his life. For

a long time, the family lived in Kaiser Josef Strasse, now renamed Heine Strasse. Freud stated that the name Josef always played a great part in his dreams, his view being that in dreams of emperors and kings these potentates symbolize the father. Joseph II (for whom the street was named) had been regarded by the liberal bourgeoise as the finest flower of the Hapsburg dynasty; as an exemplar of wisdom, benevolence, progress, and devotion to duty. In reality, this emperor was a despot who paid lip-service to the ideals of the French enlightenment. His progressiveness has been termed by Wittels as "ill-digested Voltairism", his benevolence was capricious, and his wisdom was but a fable. His notion of freedom was embodied in the maxim: Everything for the people, nothby the people. Long residence, during the impressionable years of boyhood in a street whose name carries such association was bound to have a strong influence on the highly imaginative youngster. Freud became an emperor, one around whom legends began to accumulate, who holds enlightened but absolute sway in his realm, and is animated by a rigid sense of duty—he became a despot who tolerated not the slightest deviation, held council behind closed doors, and was advised by no one—again he became the warrior entering battles against seemingly overwhelming odds, yet losing not a single encounter.

In his everyday life, little Sigmund searched for an exalted personage to set up on a pedestal. The natural figure for the boy was his father, and in this aspect two incidents in his life remained emblazoned in the boy's memory. The first occurred when Freud was eight years old. Young Sigmund had just disobeyed his father. The father turned and remarked to his wife, "The boy will never amount to anything." Little Sigmund on the verge of tears blurted out, "Your predictions will not come true, and I will be able to prove it!" The second incident occurred a few years later and here strong hints can be found of Freud's disappointment that he did not have a more powerful and successful father. When Sigmund was ten years old, his father began to let the boy accompany him on walks and laid open before him in conversation his opinion about world affairs. Intending to show how improved were the times in which the youngster was born the father told him a tale on one of these occasions: "Once when I was young, I went for a walk in your birthplace; I was well-dressed with a new fur cap on my head. A Gentile steps in my way, strikes with one hit my cap into the dirt and calls out: Jew, get off the sidewalk!" Sigmund leaned forward eagerly awaiting strong and drastic action on the part of his father. "What did you do, father?" "I stepped into the middle of the street and picked up my hat" was the quiet answer. Years later, in The Gesammtausgabe, Freud wrote, "That did not impress me as sufficiently heroic for the great and strong man who led me by the hand."

Freud attended the Sperl Gymnasium and throughout the eight years of his studies was the leader of his class; he enjoyed special privileges there and was required to take few examinations. Although the family lived in very limited circumstances, his father insisted that, in the choice of a profession, Freud should follow his own inclinations. For a long time he hesitated in his choice of a career between law and natural science. His skill as a speaker, his eloquence, his interest in universal history and in humanism, seemed to mark him out for the study of the abstract sciences. Shortly before leaving the Gymnasium he resolved to become a medical student but in his "Autobiographical Study", he states that he felt no particular predilection for the career of a physician. Rather was he impelled by curiosity, which was, however, directed more towards human concerns than towards natural objects. Under the powerful influence of a school friendship with a boy many years his senior, who grew up to be a well-known politician, he had developed a liking for law and social activities. At the same time, the theories of Darwin were beginning to take the stage, and to Freud, they held out

hopes of an extraordinary advance in the understanding of the world; but he writes that it was not until he became acquainted with Goethe's "incomparably beautiful essay on Nature," that the enthusiastic desire to become a doctor was awakened.

On leaving the Gymnasium, Freud went to England to visit his half-brother who was twenty years older than himself. This journey greatly expanded his outlook. In Austria, he had never been able to escape the sense of inferiority which early affected him, as it does all Jews in German-speaking lands, and especially those who move in intellectual circles. In England, Freud renewed acquaintance with members of his family who had not only escaped this danger, but also had fared much better financially. Furthermore, conversations with his half-brother gave Sigmund a fuller and more affectionate understanding of their father.

In 1873, he matriculated at the University of Vienna. At that date, the medical faculty was at the height of its fame. Brücke was professor of physiology from 1849-1890, and was one of the teachers who, in conjunction with Hyrtl, Nothnagel, and Rokitansky, established the theoretical foundations on which the great Viennese physicians were to build their practical successes. Incidentally, it was Nothnagel who concisely stated, "Whoever needs more than five hours of sleep should not study medicine. The medical student must attend lectures from eight in the morning to six in the evening. Then he must go home and read until late at night." The scientific investigators of this epoch had an amazing competence for the observation and description of natural phenomena, and among them Brücke was preeminent.

Upon his entrance into the Medical School, he encountered many disappointing matters. He writes: "When in 1873 I first joined the University, I was met by some appreciable disappointments. Above all I found that I was expected to feel myself inferior and an alien because I was a Jew. I refused absolutely to do the first of these things. I have never been able to see why I should be ashamed of my descent . . . of my race. I put up without much regret my non-admission to the community for it seemed to me that in spite of the exclusion, an active fellow worker could not fail to find some nook or cranny in the framework of humanity." These first impressions at the University, however, had one consequence which was afterwards to prove important, for at an early age he was made familiar with the fate of being in the opposition and of being put under the ban of the "compact minority."

In 1876 Freud entered Brücke's laboratory where he worked happily for nearly six years. Here he found rest and satisfaction— and men, too, whom he could respect and take as his models; the great Brücke himself, and his assistants Sigmund Exner and Ernst von Fleischl-Marxow. In Fleischl-Marxow, whom Freud considered brilliant, he found a warm friend. In 1877, in Brücke's laboratory, he worked out a problem in neuro-anatomy, on moammocoetes, a larval form of an early vertebrate and reported on his studies of the nervous system of the fresh water crab. In 1939 Jelliffe wrote concerning this: "Thus Freud may correctly be said to have grasped the significance of the neurone theory network from his studies of the living tissues of the fresh water crab." During the years in which he worked in Brücke's laboratory, Freud was decidedly negligent in pursuing his medical studies, and it was not until 1881 that he somewhat belatedly received his degree as a Doctor of Medicine. The various branches of medicine proper had held no attraction for him; psychiatry had been his sole genuine interest.

Freud considered the turning point in his career to be 1882, when Brücke advised him to abandon his theoretical career. This advice apparently was given because of Freud's poor financial position. So the twenty-six year old Freud left the physiology laboratory to enter the General Hospital in Vienna as an "Aspirant." He worked in various departments, and, for more than six months, studied under Mey-

nert whose work and personality had attracted him while he was still a student. As the subject of his work, he chose the medulla oblongata. He became an active worker in the Institute of Cerebral Anatomy. He wrote papers upon the course of the tracts and the nuclear origins in the medulla oblongata. But from a practical viewpoint, brain anatomy was no better than physiology, and, with an eye to material considerations, he began to study nervous diseases. In this branch of medicine, there were few specialists in Vienna. In the course of the following years while continuing to work as a junior physician, he published a number of clinical observations upon organic diseases of the nervous system. In his Autobiographical Study, Freud's discussion of this period of his life gives us a revealing incident worthy of quotation. Freud wrote: "I was able to localize the site of a lesion in the medulla oblongata so accurately that the pathological anatomist had no further information to add; I was the first person in Vienna to send a case for autopsy with a diagnosis of polyneuritis acuta. The fame of my diagnosis and of their postmortem confirmations brought me an influx of American physicians, to whom I lectured upon the patients in my department in a sort of pidgin-English." This passage is indeed valuable as a true insight into the man, for while Freud's disciples, biographers, and others have made so much of his modesty, we see that he was not without some vanity.

On one occasion, Freud introduced to his audience a neurotic suffering from a persistent headache as a case of chronic localized meningitis; his audience rose in revolt, and his premature activities as a teacher came to an end. Freud's unfortunate episode may be partially excused when we realize that the greatest authorities in Vienna at that time were in the habit of diagnosing neurasthenia as cerebral tumor.

It was about this time (1884) that an amusing, although not insignificant, happening occurred in young Freud's life. A side interest had led him to obtain from Merck some of what was then the little-known drug, cocaine, to study its physiologic activity. While this research was in progress an opportunity presented itself for making a visit to his fiancée from whom he had been parted two years. Quickly the investigation of cocaine came to an end, and in his book on the subject, Freud was content in prophesying that further use for it would soon be found. When Freud returned from his holiday, he found that one of his friends, Carl Koller, to whom he had mentioned the possibility of cocaine's being useful in the anesthization of the eye, had made the decisive experiments upon animals' eyes and had demonstrated them at the Ophthalmological Congress at Heidelberg. So Koller became the discoverer of local anesthesia by cocaine, which has now become so important; and Freud had moved a little closer to making the cause of his journey his wife.

In the spring of 1885, Freud was appointed lecturer on neuropathology and at the same time was awarded a traveling fellowship. At last he was to go to Paris and study under the brilliant Charcot! So in the autumn of 1885, he became a student at the Salpetriere in Paris. One day he overheard Charcot express his regret that since the war he had heard nothing from the German translator of his lectures. That night, Freud wrote Charcot offering to undertake the translation. Charcot accepted the offer, and Freud was admitted to the circle of his personal acquaintances, and from that time forward took a full part in all that went on in the Clinic.

What impressed young Freud most during his studies under Charcot was the latter's investigations upon hysteria. He had proven the genuineness of hysterical phenomena and their conformity to laws, the frequent occurrence of hysteria in man, the production of hysterical paralysis and contractures by hypnotic suggestion, and the fact that such artificial products showed, down to their smallest details, the same features as spontaneous traumatic attacks. Charcot proved beyond a doubt that ideas

can induce bodily changes. These views came into sharp conflict with the then dominant views in Germany. It is quite probable that Freud was not slow to realize that he was learning something which would bring him into sharp collision with the Viennese school. Before leaving Paris, Freud discussed with the great man the hypothesis that the hysterical paralyses and anesthesias of the various parts of the body are demarcated according to the popular ideas of their limits and not according to anatomic facts. Charcot took no special interest in this point. Today we know that Freud had hit upon the cornerstone of localization in hysteria.

After about a year in the Salpetriere, Freud returned home by way of Berlin. In Vienna, he settled down as a specialist in nervous diseases. His attempt to propagate the teachings of Charcot met with a bad reception. Even his old sponsor, Meynert, ridiculed the ideas and suggested to Freud that he find some cases in Vienna similar to those he had described. Freud tried to do so; but the senior physicians, in whose departments he found the desired cases, refused to allow the cases to be observed or worked with. Freud recounted how one of them, an old surgeon, broke out with the exclamation: "But, my dear sir, how can you talk such nonsense? 'Hysteron' means the uterus. So how can a man be hysterical?" Finally, outside the hospital, he came upon a young man with a case of classical hysterical hemi-anesthesia, and demonstrated it before the Vienna Medical Society. This time, he was applauded, but with the ending of the applause, was also forgotten. The impression that the high authorities had rejected his innovations was quite evident. Soon afterwards, Freud was excluded from the laboratory of cerebral anatomy and for a whole session had nowhere to deliver his lectures. He withdrew from academic life and ceased to attend the learned societies. In later years, Freud was often strongly invited to attend the Vienna Medical Society meetings, but he never again visited the organization.

In the autumn of 1886, Freud married Martha Bernays, the girl who had been waiting for him in a distant city for more than four years. Now Freud attacked the problem of making a living. His therapeusis consisted of two weapons, electrotherapy and hypnosis. Soon, however, Freud put aside the electrical apparatus as being totally ineffectual.

With hypnotism the case was better. While still a student, Freud had attended a public exhibition given by Hansen the "magnetist", and had become firmly convinced of the genuineness of the phenomenon of hypnosis. In Paris he had seen hypnotism used freely as a method for producing symptoms in patients and then removing them again. Then the news had reached Vienna concerning the school which had arisen at Nancy which successfully utilized suggestion with or without hypnotism. It was thus quite natural that during the first years of his private practice, Freud relied primarily on hypnotic suggestion in the treatment of his patients. He found hypnotic work to be really intriguing and the reputation of being a "miracle worker" quite flattering. In his work, however, he found two cardinal complaints: He could not succeed in hypnotizing every patient; some patients could not be put into a sufficiently deep sleep to produce somnambulism with amnesia which he considered indispensable for cures.

To improve his hypnotic technic, in the summer of 1889, he spent many weeks in Nancy. Here could be seen not only old Liebeault working with poor women and children of the working classes, but also Bernheim's astounding experiments with hospital cases. Two points deeply impressed him during his Nancy stay. The first was that there were mighty psychic forces hidden from human consciousness. The second was that some people cannot be hypnotized.

From the very beginning, Freud had utilized hypnosis aside from hypnotic suggestion to question patients concerning the origin of their symptoms. The inspiration for initiating this method is attributed to

Dr. Josef Breuer who was one of the most respected family physicians in Vienna. This man, who was of striking intelligence, and who had made important contributions upon the physiology of breathing and upon the organ of equilibrium, befriended Freud. Even prior to Freud's Paris studies, Breuer had told him of a case of hysteria which he had treated between 1880 and 1882 in a unique manner which had led him to penetrate deeply into the causation and significance of hysterical symptoms. Freud had been extremely impressed with Breuer's case material and in Paris had informed Charcot concerning the case. The latter took no interest in the subject; so the matter was, for the time being, put aside. Now that Freud was back in Vienna, Freud turned once more to Breuer's observations and made him recount more about the case. The patient, Anna O., had been a young girl with superior education and gifts, who had fallen ill while she was nursing her father of whom she was very fond. When Breuer saw the patient, she presented a variegated picture of convergent strabismus, disturbances of hearing, paralyses, numerous contractures, inhibitions and states of mental confusion. A chance observation showed the old physician that relief could be obtained from these clouded states of consciousness if she was induced to express in words the affective phantasy by which she was at the moment dominated. Breuer searched for a manner in which fully to utilize this factor. Finally he hit upon a plan. The patient was put into deep hypnosis and made to tell each time what it was that was oppressing her mind. With the overcoming of the depressive confusion attacks, the inhibitions and physical disorders were next rectified. In her waking state the girl could no more describe than other patients how her symptoms had arisen, and she could discover no link between them and any experiences of her life. In hypnosis, she immediately revealed the missing connection. It became apparent that all her symptoms went back to moving events which she had experienced while nursing her father, that is, her symptoms had a meaning and were residues or reminiscences of those emotional situations. In most instances, it turned out that there had been some thought or impulse which she had had to suppress while she was at her father's bedside, and that, in place of it the symptom had afterwards appeared. As a rule, the symptom was not the precipitate of a single such "traumatic" scene, but the result of a summation of a number of similar situations. When the patient recalled a situation of this kind in a hallucinatory way under hypnosis and carried through to its conclusion with a free expression of emotion, the mental act which she had originally suppressed, the symptom was abolished and did not return. By this procedure, Breuer succeeded, after long and painful efforts, in relieving the patient of all her symptoms.

Now to Freud the question arose as to whether or not it was possible to generalize from this single case. So Freud began to repeat Breuer's investigations with his own patients and eventually, after observing for several years, concluded that his findings were invariably confirmed in every case of hysteria that was accessible to such treatment. Freud proposed to Breuer that they should issue a joint publication. The latter finally agreed but only after vehement objections. In 1893 they issued a preliminary paper, "On the Psychical Mechanism of Hysterical Phenomena", to be followed in 1895 by "Studies of Hysteria", in which Breuer supplied the material content and Freud a theory of the unconscious and — for the first time — the importance of sexuality. Coincidences were noted between anxiety hysteria and coitus interruptus and between neurasthenia and masturbation, and the argument was drawn that actual neuroses were direct toxic effects of sex while the psychoneuroses were mental impressions of it. The medical profession greeted this book with stark incredulity. Even Breuer, who at first helped, broke with Freud when the latter pointed

out the transference love in the patient, "Anna."

It was about this time that the Freud family encountered financial difficulties. Freud had sacrificed his flourishing practice to devote himself entirely to his new science. His professional income, the only means of making a living, dwindled rapidly just at the time when his family increased (six children, three boys and three girls were born within ten years). The attitude of friends and acquaintances in general was that of pity for the poor woman whose husband, formerly a clever scientist, had turned out to be a rather disgusting freak. Frau Professor, as Freud's wife was called by everyone, never wavered in her admiration. To her, he was a great man before a word of his book was written as well as afterwards. Her devotion was fully shared by the children. Friends of the family frequently made fun of the solemn way they spoke of everything concerning their father. For instance, it was said that when one of the children had been absent for some time and was met by another, the first words from the newcomer were, "Father now drinks his tea from the green cup instead of from the blue one." The life of the family is said to have revolved around the father as his life revolved around his work.

Mrs. Freud was small, lithe, active, the typical housewife who was always busy putting something in order or cleaning and brushing — always accurate to the last detail of neatness and order, yet in one respect she did not conform to the type. Instead of being regarded by her servants as a curse, as these model housewives usually are, she was extremely popular with them. Her great kindliness and deep humanity never tolerated the idea that the life of a human being should be subordinated to the welfare of the furniture. She showed much generosity in finding the most suitable Christmas presents for all the retainers of the family, not only for everyone who was connected with the household but also for his or her relatives. Her sister, Minna, once made the remark that the line was drawn at the niece of the milkman.

But to return more directly to Freud's work, we find that he began realizing the limitations and disadvantages in using hypnotism as a therapeutic measure. Searching for a substitute, he remembered an experiment he had witnessed while working with Bernheim. He recalled the awakening of a person from the state of somnambulism with the apparent loss of memory of what had happened while he was in that state. Bernheim had maintained that the memory was present all the same; and if he insisted on the subject remembering, if he gave assurance that the subject knew it all and had only to say it, and if at the same time he laid his hand on the subject's forehead, then the forgotten memories returned, hesitatingly at first, but eventually in a flood and with amazing clarity. Freud determined that he would act in the same way. So hypnosis was abandoned and replaced by free association. The only part of hypnosis being retained was that of requiring the patient to lie upon a sofa, while the physician sat behind, seeing the patient but not being seen. Using hypnosis, Freud had called it "the cathartic method" because he considered its efficacy to be upon the mental and emotional purging which the patient went through during the treatment. The symptom was considered a monument of some disagreeable and forgotten (repressed) act of the patient's past. The patient did not, however, recognize the significance of this monument any more than a child could understand Einstein's theory of relativity.

This idea for the first time showed the importance of distinguishing between conscious and unconscious states and later was amplified and developed as the psychology of the unconscious. The patient was supposedly unable to give expression to his feelings because the situation in question precluded it, so that the idea was repressed from consciousness and thus excluded from further elaboration. But as the repressed material remained dynamic and continuously strove to come to consciousness, the

sum of energy finally worked itself to the surface on a wrong path and thus produced the symptom. In other words, the symptom represented a conversion of psychic energy into a physical manifestation, such as pain or paralysis or even into an obsession. The cure or the mental and emotional catharsis was effected through the process of abreaction, that is, the hypnotized patient abreacted or worked off the repressed material by living through it and giving free vent in speech and action to the feelings that were originally excluded from consciousness.

Some have said that Freud was as much an artist as a scientist in the birth of psychoanalysis. True and therefore all the more power to him! For who but an artist would grasp by intuition many matters that would have escaped an investigator rigorously bound to traditional scientific methods. The founder of psychoanalysis, he would never have become the elaborator of it that he was, if he had proceeded cautiously.

Many consider Freud's work and psychoanalysis the typical product of Vienna and its peculiar moral atmosphere; the same has been said of Franz Schubert's music. Freud attempted to explode this allegation in the "History of the Psychoanalytical Movement" by pointing out the logical fault of the casual connection between his discovery and the asserted looseness of sexual morality in Vienna. From a science which had been hushed, trampled on and debauched, psychoanalysis has grown until now its broadening fields may be considered to be the foundation of modern psychiatric thought.

The basic concept of psychoanalysis centers about mental topography which considers the mental apparatus as an integrated whole of which three concrete parts may be described. The first part is the id, entirely unconscious harboring the crude instincts seeking expression. The instincts differ considerably from the conscious and are essentially selfish, uncivilized, and unmoral. The second group is termed the ego. The ego is split off from the id by contact with reality through the sensory-motor apparatus whose function is to maintain harmony between the id and external reality. It is the conscious self. The last group is the super ego, largely conscious, the repressing agency, whose function is to keep id under cover. It might well be termed the inner conscience or censor and embodies the ideals, morals, and inhibitions characteristic of man.

There are many other points to the psychoanalytic theory, but Freud considered three to be paramount: the libido, infantile sexuality, and transference.

The libido: he believed that most mental processes are derived from the interplay of forces which are originally instinctive in nature. These forces represent themselves by images or ideas which carry an emotional charge. They are termed the libido or sexual instinct and largely determine the quality of the personality structure and functioning, the principal types being dominantly in chronological order of appearance narcissistic, oral, anal, phallic, and genital.

Infantile sexuality: sexual development of the child goes through many phases before normal adult development is reached. Freud applied the term, "Oedipus complex," to immature sexual attachments which persist into adulthood. He believed that the infant develops emotional attachments with strong sexual coloring toward the parent of the opposite sex. Normally at puberty, other interests replace the parental attachment. With the failure of this displacement to occur the individual may be immature and unable to make a satisfactory adult sexual adjustment. Partial frigidity in women or relative impotence in men often occurs.

Transference concerns the emotional relationship between the patient and his physician. Especially in psychoanalytic therapy is this important. It may be affectionate or hostile, or passive or active. It is believed to be based not upon the actual situation, but instead comes from the emotional relationships of the past, that is, the patient tends to identify the doctor with his parents and other important characters of the past, transferring to the physician the

feelings which he formerly had for the original character.

Modern psychoanalytic therapy consists first of a series of interviews usually arranged to determine whether or not the patient is suitable and cooperative. If the patient accepts treatment, the analytic procedure may be commenced. This often requires one hour sessions (four to six times weekly) over a period ranging from one to five years. During a session, the method of free association is used, the physician largely guiding the patient.

With a successful analysis, the patient should have recovered from the mental conflicts and should understand how they develop and be able to prevent their recurrence. It should be pointed out, however, that some, particularly the poorly organized, are apparently made worse.

To think that Freudian psychoanalysis is the only type is indeed a most serious error. Jungian psychoanalysis as promulgated by C. G. Jung of the University of Zurich has come to play a very important role in psychiatric thought. Jung was an early follower of Freud, but in 1913 they parted "without feeling the need to meet again" and since that date, there has been an active warfare between the two schools as well as an increasing divergence in theory and practice. The Jungians' main argument is against the Freudian pansexuality of human interests. Jung deals with a personal unconscious which harbors the repressed desire of the individual and also with a collective unconscious in which is preserved the experience of the race. The collective unconscious is inhabited by divinities, saviors, magical beings and other strange powers termed arche-types whose activities dominate the fanciful world as expressed in mythology, folklore, dreams and psychoses. Still another school is that of Alfred Adler, another of Freud's ex-followers. Adler developed what he called "Individual Psychology" as an outgrowth of Freud's ideas. This places less emphasis on Freud's libido theory, and emphasizes more the individual's striving for power, superiority, and self-assertion. It stresses the theory of organ inferiority.

Between and around these three schools, one which might be termed realist and the other two romanticist have developed and will continue to develop many tangential lines of thought.

For several years Freud had been studying the use of dreams in psychoanalysis. Early in 1900 appeared "The Interpretation of Dreams." Now the basic structure of psychoanalysis was complete. The "Interpretation of Dreams" was fiercely attacked. Many close followers shook their heads over this book.

Let us examine Freud's beliefs: he believed the dream related by the dreamer to be not the dream that was dreamed. To learn the hidden significance of the dream, it was necessary to reach back from its ostensible meaning to the thoughts of which it is the mask. Like a cipher, the dream can only be understood with the aid of a key. The deciphered dream was invariably associated with a deep significance. Furthermore, Freud believed that the dream gave expression to impulses that were deeply hidden. Forbidden wishes, feelings of love and hate, criminal trends, delusions of grandeur, self-adulation, longing for death — all these manifest themselves in dreams, but their meaning is so artfully covered up that the dreamer is unable to grasp the significance of his own dream. With an understanding of dreams, we find unwelcome thoughts. The dead return—the suppressed thoughts of evil, the shapes that we want to keep from the light of the day, the thoughts that had been thrust down into the well of the unconscious. In our dreams, we murder our nearest and dearest. We revel in perversions at which we shudder in our waking hours. All our criminal instincts are unchained in the dream. No one knows what we dream. We do not even know it ourselves, for the dream distortion hides from us, as from others, the true meaning of our orgies. Dreams that might betray us too readily are forgotten; they cannot pass the censor. Now, how did

Freud utilize these ideas? Very simple—the munition manufacturer dreams of war; the henpecked husband dreams of free love; the woman whose husband is impotent dreams of athletes and operatic tenors. The wife who murders her husband in dreams makes up for it by lavishing so much attention on him that the poor fellow is driven almost crazy. The henpecked husband dreams of obscene adventures, and atones for his dreams in daily life by sanctimoniousness, by looking down upon the most innocent pleasures. Little wonder that the world frowned and has continued to frown at this work on dreams. In Vienna this book was met with complete silence and relegated to the care of a clinic assistant who had already written a book from the opposed viewpoint.

Nevertheless, a little circle of physicians had begun in 1902 to gather around Freud into which came Dr. Alfred Adler, in 1906 Dr. C. J. Jung, and in 1907 Dr. Eitinger. Then in 1908 a first psychoanalytical congress was held at Salzburg, with Jung being made editor of the Journal. The consequences concerning Jung's ascension to power are indeed most interesting.

Freud preferred to leave all formal functions to others; filling an official post, being the figurehead, standing personally in a prominent position were things that went strongly against his grain. For this reason in 1910 he insisted on the installation of Jung as president of the newly founded International Association, which later proved to be a costly mistake. The Zentralblatt was launched with Adler and Stekel as editors; and, later to deal with the applications of analysis to the mental sciences, Imago, edited by Hanns Sachs and Otto Rank.

The years 1904-1908 found Freud working primarily on sexual theories. The lecture on Modern Sexual Morality and Modern Nervousness was heard around the world. Quickly, he was labeled a pansexualist. Psychiatrists and laymen alike jeered at the Austrian extremist. For psychoanalysists who went further into the question, a sexual dilemna was raised. For, on the one hand, psychoanalysis had shown that sexual abstinence was one of the most important factors in the formation of neuroses. On the other hand, the economic circumstances of most students made it impossible for them to marry early. Morality forbade the seduction of young girls, the danger of infection made sexual intercourse with prostitutes inadvisable. Finances and judgment made early marriages not to be desired, and so Freud's advice to the young students was, "Be abstinent, but under protest." He believed that it was imperative to keep alive the inner protest against a social order which prevented mature young men from fulfilling a normal instinctive need. Like Anatole France whose writings he loved, Freud did not believe in sudden and violent revolutions; he put more faith in the steadily mounting, continuous force of patient resistance to bring about ultimately changes in the social order. He often reiterated that in regard to money and to sex, men are hypocrites; in both these realms they refuse to confess their true needs. Very illustrative of this theme and yet very amusing is a passage from a novel of Anatole France. In Monsieur Bergeret a Paris, a young man attempts to seduce a lady. Anatole France, the connoisseur of women concludes his description as follows: "He came to her again, took her in his arms, and covered her with caresses. Within a short time her clothes were so disarranged that — aside from any other considerations — shame alone compelled her to disrobe."

Sensation-hunters had hoped to find in his life all the wildness that they did not like to see in their own mind, and were sorely disappointed to find out that Freud's way of living showed no pan-sexualism. His thoughts and desires were too well-balanced.

Nineteen hundred nine saw the unsuccessful journey to the United States. An invitation from Clark University to give a series of lectures and to receive an honorary degree on the occasion of its twentieth anniversary was the first public recognition of his new science, and the lectures

were to become an undisputed triumph. Besides, Freud was grateful for the courtesy shown him by Professor G. Stanley Hall, the President of the University, and he felt unmixed respect for Professor Putnam in Boston who, in spite of his Puritan background and ancestry had defended the "immoral" psychoanalysis. Accompanying Freud were three of his best friends at the time: Ferenczi, Jones and Jung. To Freud, it was like the realization of a fantastic daydream when he took the lecturer's seat in Worcester to give his five lectures on psychoanalysis. Psychoanalysis had ceased to be an illusion, it had become a valuable piece of reality. Yet everything went the wrong way and he came home with a heavy load of dreary impressions which henceforth distorted his picture of America. Years later he confided to a friend: "America is the most grandiose experiment the world has seen, but I am afraid it is not going to be a success." Although Freud had been successful in explaining analysis, he had been unhappy and physically sick. Freud often made disparaging remarks about America and Americans. He resented the overeagerness of the Americans to entertain him. Having a will of his own, he became disgruntled when he was rushed around from place to place to see things in which he was only moderately interested.

"American women," he said, "are an anticultural phenomenon. They have nothing but conceit to make up for their sense of uselessness. You have a real rule of women in America. You, your young men go to college with girls, fall in love and marry young at an age when the girls are usually much more mature than the men. They lead the men around by the nose. Your average American man approaches marriage without any experience. You wouldn't expect a person to step up to an orchestra and play first fiddle without some training, but the American man steps into marriage without the least experience for so complicated a business. But," he continued, "your American woman has her good points, too; she hasn't got the European woman's constant fear of seduction, for example."

September 1911 found the International Psychoanalytical Congress holding its third meeting. Jung was again reelected president — this time with Freud's opposition. The schism had started.

Nineteen hundred twelve-thirteen brought the two grave secessions. Adler started the previously mentioned school of "individual psychology" which repudiated the importance of sex, traced character and neuroses to body-zones and to organ inferiority, and emphasized the "masculine protest." Jung, Freud's "dear and trusted friend", started an abstract, impersonal and non-historical school of "analytical psychology", rejecting what he found repellant in Freud, especially infantile sexuality and the Oedipus complex.

Then the first world war came on the scene. Immediately Freud's concepts of the "advantage of being ill" and "flight into illness" came into great popularity. During the war, Freud's writings continued to be prolific. With unmixed pleasure he observed the extreme usefulness of his principles in the therapy of soldiers. With peace, he settled back to complete all the writings that lay in his mind, but in 1923, Freud's excursions and discussions came to a sudden end with the ominous appearance of disease — a carcinomatous growth inside the mouth. Until the outbreak of the fatal disease his vigorous vitality had been undimmed by age although he approached his seventieth year. The hope for a ripe old age, attained in good health and strength of body and mind was not unjustified. His mother had borne him, her eldest son, before she was twenty; she was still alive to see his seventieth birthday. She reached the remarkable age of ninety-three years. Until about a year before her death she was hale and hearty, and full of energy. The tale is told that on the evening before his seventieth birthday Freud went to see her and receive her congratulations, so that she should not have to come the long way from the suburb where she lived to his house.

Next morning the first visitor who rang the bell was his mother.

The first superficial operation (1903) performed by a former fellow student of Freud, Professor Hajek, had done nothing to stop the malignant growth. The best experts were called in, and a radical operation was decided upon. A portion of the jawbone had to be removed; eating and talking were made possible by prosthesis. Professor Pichler, the famed surgeon of Vienna took over the treatment and prolonged Freud's life for a number of years. Since the surface of the scar left by the operation in the mucous membrane of the mouth was constantly changing, the prosthesis had to be changed and remodeled constantly. In spite of all this it caused constant pain which Freud bore without complaint. But that he was extremely sensitive about the resulting speech defect which made it at times difficult to understand him, there can be no doubt. More and more, it became his habit to live in seclusion and to see, besides his family and his analysands, only his intimates or those in whom he was particularly interested. He was still more sensitive about being observed while eating, and invitations to dine with him became an extreme rarity.

The seventy-fifth birthday brought not only congratulations but also celebrations and acclamation. But the more the name of Freud was honored and the greater grew the number of those who wanted to express their reverence and admiration, the wider became the gulf between these loud glorifications and the suffering, withdrawn old man who, in his seclusion, continued his work with great determination while he saw death creep relentlessly nearer. It was known that Freud was fond of orchids, and orchids of all colors and descriptions came by the cartload. The modest conservatory, where his wife by extreme diligence had grown a few choice flowers, was crowded with orchids which overflowed into the living and dining rooms. Freud, however, paid little attention to them, and two or three days afterwards they were to be found in the garbage can — a fitting symbol of fame that comes late, extravagant and indiscriminant.

The world had become "Freud-conscious." The best and foremost of contemporaries sought to make his personal acquaintance: Einstein, Thomas Mann, Romain Rolland being among them. In Lou Andrea-Salome, the friend of Friedrich Nietzche and later in Marie Bonaparte, Princess of Greece, he found disciples who combined feminine intuition with the gift of clear and independent thought.

The place of the dwindling human contacts was taken by a new and unexpected companionship. His daughter, Anna, who loved dogs became the owner of a big Alsatian. He was a very nice and friendly dog, but somewhat big and noisy for an apartment. Freud, instead of protesting, became attached to the dog and enjoyed his pranks, spoiling him not a little. Not much later Marie, Princess of Greece, presented him with a Chow. This dog was the daughter of Tartoun who belonged to the Princess and united in his manner the dignity of a nobleman with the polished manners of a courtier. Freud became very fond of the dog and still more of its puppies. From then on, Freud was seldom seen without one of his dogs. In the midst of his talk and in spite of his pains he gave them some attention—watching them tenderly, superintending their food and drink, playing with them, and patting their heads; he used to play with his ring, which previously he had frequently removed from his finger and twirled on his desk.

So the years went by, each adding slightly to the triple load of old age, pain, and the threat of imminent death. Soon the middle age wiry man was changed into the picture of a bent, icy-grey, shriveled old man. But what counted most in his life did not undergo any change; his work, his gift for new and original thought, his insistence on distinguishing between truth and hypocrisy were still as much a part of him as the breath of life.

At the advanced age of eighty, Freud re-

turned to the study of the Hebrew Bible (Old Testament) which had attracted him as a boy of ten, and he presented the world with his Moses and Monotheism, a book which many consider the most interesting Freud ever wrote. It was in his "Autobiographical Study" that Freud stated, "My early familiarity with the Bible (at a time almost before I had learned the art of reading) has, as I recognized later, an enduring effect upon the direction of my interest." These simple words have a deep meaning. Freud realized that the biblical myths, as myths in general, are expression of human urges and impulses, cravings and longings, that moved man in the infancy and childhood of the human race, that move every child in its impressionable years when he recapitulates man's mental development from the animal to the civilized stage. Man was supposed to be continually wrestling with these urges and impulses, often being overcome by them to the end of his life. In his mature manhood, Freud was to find a cure for many of the mental sicknesses caused by the conflict of those psychic forces and devise a method for the interpretation of the myths.

Nineteen thirty-three saw the rise of Hitler to power. When Freud learned that in Berlin his books, together with Heine, Schnitzler, Wasserman and many others, had been solemnly consigned to perdition and burned, he said calmly, "At least I burn in the best of company."

When queried as to his own fate at this time, he said, "They told me that psychoanalysis is alien to their Weltanschauung, and I suppose it is." He said this with no emotion and little interest, as though he was talking about the affairs of some complete stranger. A dark cloud hovered over Europe — soon Austria was marked as its next victim. Freud's situation became especially dangerous in the event of a German invasion. His books had been solemnly burned in Berlin, and his name was among the first on the proscription list. Offers of an asylum, a place of safety in a better-protected country had been made, but he refused to accept them.

Then the long foreseen happened: Hitler invaded Austria and the rest of the world stood by without lifting a finger. The brutalities committed during five years in Germany became but a trifle when compared to what was dealt out in the first few days of the occupation. With the news of the invasion, Ernest Jones came from London and Marie, Princess of Greece, from Paris. These together with Mrs. Dorothy Burlingham of New York, who had lived in Vienna almost as a member of the Freud family, formed a sort of bodyguard by using their influence with the diplomatic representatives of their respective countries. In this way Freud was spared the personal insults and injuries which were inflicted on thousands of his race and many others.

Soon Freud was invited by the English government to take his residence in England. The permit was finally granted but only after the Nazis had confiscated everything they could lay their hands on, and Anna Freud had been given the third degree at Gestapo headquarters in an attempt to get a confession from her as to how and when money had been sent out of the country or otherwise concealed. By the sacrifice of a large sum of money, Princess Marie had succeeded in buying back Freud's collections and his library which accompanied him to England. Everything else Freud had was confiscated.

On his way through Paris, Freud was greeted by the American ambassador to France, Mr. Bullitt; in England he was warmly welcomed. A great deal of publicity was given to his arrival. As soon as possible he escaped from it and returned to his work in the old persistent, unostentatious way as if nothing extraordinary had happened to bring him from Bergasse 19 to 20 Moresfield Gardens. Here the atmosphere appeared quite different from the surrendered country he had just left. The house was pervaded by a peaceful and calm atmosphere. The rooms were much more comfortable and airy than the little study in Vienna. The garden was not large, but it had a fine lawn, and old trees jutted over the walls. But behind this superficial cur-

tain of tranquility stalked the dreaded reality, the presence of constant pain and suffering. The pain in his mouth permitted him to find but little sleep. Occasionally, he slumbered for a few minutes in a swing couch that had been constructed in the garden. Here he could be seen resting, sometimes in light slumber, sometimes caressing his Chow who did not leave his side for a moment. He appeared unbelievably old and very ill. Every word was pronounced at the cost of an enormous effort. But these tortures did not wear down his will. His analytical hours were kept whenever he had even the slightest alleviation of pain, and when he was strong enough to hold the pen, his letters were written with his own hand.

Not once did he complain. No moan or lamentation came from his lips. But he did refuse then, as he always had, to lighten his burden by self-deception or self-willed ignorance. Unflinching without even using the emotional refuge of self-dramatization, which is so often utilized, he met his fate.

On September 23, 1939, a great man passed down the aisle of time — Freud the discoverer, to his last days the courageous adventurer in the realm of causations of human behavior.

Above even the clamor of war was heard the news of the passing away of the great psychologist. The position he occupied in science and mental therapy will scarcely be filled by any one successor. Psychology's vocabulary is full of words which testify to his influence, and a compilation of his works shows twelve complete volumes and 179 titles. Yet what to mankind was a tragic loss was to the man himself a release from a life filled with sufferings that were intensified in the last years and became unbearable at the very end.

Much discussion has occurred about the place that Freud and his discoveries will take in the history of human thought. No one can doubt the eminence of his originality. Over the years he had vitalized whole sections of thought in many fields—psychiatry, psychology, sociology, education, social work. Even the philosophers took note of his clinical observations and theories. Indeed, it would be quite difficult to hazard a guess as to which field Freud's contributions will ultimately prove to have the greatest value. At any rate, in whatever category Freud and his genius can and will be placed, the world's thought is enormously indebted to him.

BIBLIOGRAPHY


Alexander, Franz: Sigmund Freud—the man, Medical Leaves, 3:11, 1941.

Bernfield, S., and Bernfield, S. C.: Freud's early childhood, Bull. Menninger Clinic, 8:107, 1944.

Brown, J. F.: Freud's contributions to psychology, Am. J. Orthopsychiatry, 10:843, 1944.

Brill, A. A.: Reflections, reminiscences of Sigmund Freud, Medical Leaves, 3:18, 1944.

Brill, A. A.: The March of Medicine, New York, Columbia University Press, 1943.

Brill, A. A.: Freud's Contributions to Psychiatry, New York, W. W. Norton and Company, 1944.

Feldman, A. A.: Freud's Moses and Monotheism and the three stages of Israelitish religion, The Psychoanalytical Review, 31:361, 1944.

Frank, L. F.: Freud's influence on western thinking and culture, Am. J. Orthopsychiatry, 10:880, 1940.

Freud, S.: The Interpretation of Dreams, New York, The Macmillan Co., 1915.

Freud, S.: Group Psychology and the Analysis of the Ego, New York, Boni and Liveright, 1922.

Freud, S.: The Psychology of Everyday Life, New York, The Macmillan Company, 1930.

Freud, S.: An Autobiographical Study, London, Hogarth Press, 1935.

Freud, S.: Modern Sexual Morality and Modern Nervousness, New York, Eugenics Publishing Co., 1938.

Freud, S.: Moses and Monotheism, New York, Alfred A. Knopf, 1939.

Freud, S.: A General Introduction to Psychoanalysis, Garden City, Garden City Publishing Co., 1943.

Graf, M.: Reminiscences of Sigmund Freud, Psychoanalytic Quarterly, 11:465, 1942.

Grinker, R. R.: Reminiscences of a personal contact with Freud, Am. J. Orthopsychiatry, 10:850, 1940.

Hopkins, Pryns: Sigmund Freud, Character and Personality, 8:163, 1940.

Jastrow, J.: The House that Freud Built, New York, Greenberg, 1932.

Jelliffe, S. E.: Freud as a neurologist, J. Nerv. & Ment. Dis., 85:696, 1937.

Komora, P. O.: Notes and comments on Sigmund Freud, Mental Hygiene, 24:147, 1940.

Mann, T.: Freud, Goethe, Wagner, New York, Alfred A. Knopf, 1937.

McKinley, J. C.: An Outline of Neuropsychiatry, Minneapolis, Univ. of Minnesota, 1944.

Mohr, George J.: Freud and psychoanalysis, Am. J. Orthopsychiatry, 10:843, 1940.

Oberndorf, C. P.: Psychic determination in Holmes and Freud, Mental Hygiene, 28:289, 1944.

Reik, T.: From Thirty Years with Freud. New York, Farror and Rinehart, 1940.

Sachs, Hanns.: Freud, Master and Friend, Cambridge, Howard University Press, 1945.

Wittels, Fritz: Sigmund Freud, New York, Dodd, Mead and Company, 1924.

Wittels, Fritz: Freud and His Time, New York, Horace Liveright, Inc., 1931.

Wittels, Fritz: Freud's scientific cradle, Am. J. Psychiatry, 100:521, 1944.

Wortis, Joseph: Fragments of a Freudism analysis, Am. J. Orthopsychiatry, 10:843, 1940.

NEW ORLEANS

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## A NATIONAL HEALTH DEPARTMENT

The Council on Medical Service of the American Medical Association is to be congratulated on the news bulletins with which they are keeping the members of the organization informed as to legislation in Washington.

Bulletin No. 6 discusses the establishment of a separate national health department. The readers of the Journal of the A. M. A. who have been following Fishbein's history of the organization which has been coming out serially in the Journal will remember that almost sixty-five years ago the A. M. A. called for the organization of a separate department of health under a cabinet officer. A few years later a committee was appointed to bring this matter before Congress and almost continuously up to the present time, the House of Delegates has recommended the establishment of "A Federal Executive Department to be designated as the Department of Health, with a doctor of medicine at its head who shall have general supervision and direction of the affairs of the federal government pertaining to the health of the people."

It appears possible that this much to be desired department might be established. There are two bills before the Senate at the present time; one, No. 140 and one, No. 545. The latter provides for a separate department of health with a cabinet head, the other, the establishment of a rather heterogeneous group, consisting of three executive departments; welfare, education and medical activities. The head of this division should have cabinet status and under him would be three executives for the three divisions which are represented.

It will be interesting to see what action will be taken by the House of Delegates at the coming meeting of the American Medical Association in June. There seems to be a considerable opposition of the medical profession to S. 140, as well as to S. 712. The bulletin of the Council on Medical Service states that if it is not possible or feasible at the present time to have a separate department of health it would be better to group health activities in a separate bureau and not have them tied in with other activities in a department with cabinet status.

## THE DIGITALIS GLYCOSIDES

The tendency seems to be at the present time for a greater and greater use of the purified crystalline digitalis derivatives as a substitute for the powder or the tincture of foxglove. The powdered whole leaf has, up until a comparatively few years ago, proved reasonably satisfactory for the treatment of the patient with heart disease who must take this drug. However, there are certain advantages in the crystalline digitalis derivatives which make for greater exactness in its dosage and a more satisfactory maintenance of the digitalization. Here in the south, LaDue of the Department of Medicine of Louisiana State University was one of the first to urge the use of Cedilanid, which is a crystalline form of glycoside C which comes from *Digitalis lanata*.

This particular preparation is of particular value in the treatment of cardiac emergencies. On the other hand it is not absorbed when given orally with the same regularity as is Digoxin or Digitoxin. Consequently the last two preparations are probably to be preferred in the treatment of the ordinary ambulatory patient who requires digitalis. One of the advantages of Digoxin or Digitoxin is that the dose is given in the metric system and by weight. With these glycosides of digitalis the unsatisfactory method of standardizing a batch of digitalis leaves is no longer necessary. The dosage is exact and at a definitely predictable relationship to the human being. A milligram truly represents the same amount of effective material rather than a milligram of powdered leaf which contains a variable amount of the effective substance. The maintenance dose of Digoxin, incidentally after digitalization, is approximately 0.25-0.75 mg. daily. The dose of Purodigin, Cardiodigin, Crystodigin, and other brands of Digitoxin, 0.1-0.3 mg. to be taken once a day.

## NEW ORLEANS GRADUATE MEDICAL ASSEMBLY

The recent meeting of the New Orleans Graduate Medical Assembly was well attended by a group of physicians who came from all over the United States. There was a total registration of 1598 and a state representation of 33 different states. Louisiana, of course, led all of the states but there were 107 doctors from Texas, 51 from Mississippi, 36 from Alabama, 33 from Georgia, and the other sates of course having a smaller number in attendance. Incidentally California had three people attending and the little state of Vermont one. The two foreign representatives came from, in one instance, Canada and the other the Philippines.

The sessions of the meeting were very well attended, largely due to the fact that an excellent scientific program had been provided for the doctors who attended the meeting. This yearly meeting is growing, and growing rapidly in importance and in popularity. Undoubtedly there would have been many more in attendance if it were not for the hotel situation in New Orleans.

Following the meeting some of the attendants made a trip to Mexico City where a three day program of scientific import was provided for the visiting physicians. The scientific meetings were not too long so that there was ample time for sightseeing and for having a good time.

# ORGANIZATION SECTION

**The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.**

***An informed profession should be a wise one.***

## EXECUTIVE COMMITTEE

March 29, 1947

At a meeting of the Executive Committee held in New Orleans on the above date considerable discussion took place concerning the present status of the EMIC

program. Unfortunately, some of the doctors of the state have continued to accept cases under this plan although it was officially discontinued by the State Society in May of last year. Explanation has been secured from time to time from the Department of Health to the effect that when a doctor states he will accept a case the Department of Health will continue to participate in the plan by accepting the application also. In other words it appears that the only way to terminate the program is for ALL of the doctors to cooperate with the State Society by refusing to handle such cases under the EMERGENCY PLAN. As a result of this discussion the secretary was requested to secure a complete report from the State Department of Health as to the present status of the EMIC plan, including names of doctors who have continued to participate, and report the information secured to the House of Delegates.

The Congressional Committee has gone on record as opposing Senate Bills 140 and 712 and has so advised congressmen in Washington and the Executive Committee, at this meeting, approved action of the committee in this regard.

In discussion of the report of the Committee on Voluntary Prepayment Medical Insurance the question was raised as to the necessity for laymen on the Board of Directors of the Louisiana Physicians Service, Inc., and it was agreed by the Executive Committee that recommendation for such additions to the Board be made to the House of Delegates.

Resolution concerning Sections on the General Practice of Medicine, as approved by the American Medical Association was presented to the Committee and it was decided that this should be referred to the House of Delegates for discussion and action.

There has been opposition expressed during the past few months by members of the Executive Committee to the appointment of A. W. Dent to the Federal Hospital Council and although letters have been sent to the Social Security Administration concerning this subject there has been no action taken to rescind the appointment. The Executive Committee has therefore, in accordance with action at the meeting on the above mentioned date, brought the attention of this appointment to other state medical societies in the southeastern section of the country and the Southeastern Hospital Association.

The recommendations of the Committee on Budget and Finance, including approval of the budget as prepared for 1947, transfer of balance in the Cancer Committee checking account to the checking account of the general fund, investment of $10,000.00 of the amount in the checking account of the general fund in U.S.A. Series G Bonds and recommendation to the Chairman of the Committee for Aid to Indigent Members that $2,000.00 from the Fund for Aid to Indigent Members be invested in the same type bonds, were approved. Since the amount in the trust fund for Medical Defense will soon reach, by per capita appropriation, $20,000.00 it was decided that recommendation should be made to the House of Delegates that this fund be allowed to increase to $40,000.00. The subject of deficits which might occur by committees on arrangements for annual meetings was discussed and it was decided that any such deficits should be approved by the House of Delegates or the Executive Committee before being paid from the general fund. The Budget and Finance Committee was advised that it was the wish of the Executive Committee that a report of receipts and expenditures for 1946 and a copy of the 1947 budget should be sent to each member of the Society.

# TRANSACTIONS OF ORLEANS PARISH MEDICAL SOCIETY

May 12. Joint Scientific Meeting with the Louisiana State Medical Society, Roosevelt Hotel, 8 p. m.
May 13. Louisiana State Medical Society Meeting, Roosevelt Hotel.
May 14. Louisiana State Medical Society Meeting, Roosevelt Hotel.
May 15. Clinico-pathologic Conference, Touro Infirmary, 12 noon.
Veterans Administration Hospital Staff, 8 p. m.
May 16. The Orleans Society of X-ray Technicians, 7:30 p. m.
Lakeshore Hospital Staff, 8 p. m.
Executive Committee, Hotel Dieu, 8 p. m.
May 19. Hotel Dieu Staff, 8 p. m.
May 20. I. C. R. R. Hospital Staff, 12:30 p. m.
Charity Hospital Medical Staff, 8 p. m.
May 21. Charity Hospital Surgical Staff, 8 p. m.
May 22. DePaul Sanitarium Staff, 8 p. m.
May 23. L. S. U. Faculty Club, 8 p. m.
May 27. Baptist Hospital Staff, 8 p. m.
May 28. French Hospital Staff, 8 p. m.
May 29. Clinico-pathologic Conference, Touro Infirmary, 12 noon.
May 30. Poliomyelitis Preparedness Conference, St. Charles Hotel, 2 to 5 p. m. and 7:30 p. m.
New Orleans Hospital Dispensary for Women and Children Staff, 8 p. m.
May 31. Poliomyelitis Preparedness Conference, St. Charles Hotel, 9:30 p. m.
June 2. Board of Directors, Orleans Parish Medical Society, 8 p. m.
June 3. Eye, Ear, Nose and Throat Staff, 8 p. m.
June 4. Mercy Hospital Staff, 8 p. m.
June 5. Executive Committee, Baptist Hospital, 8 p. m.
June 6. Ochsner Clinic Staff, 8 p. m.
Every Thursday, Medical Toastmasters, Hutchinson Memorial Auditorium, 8 p. m.

N. J. Tessitore, M. D., Secretary.

## NEWS ITEMS

Dr. Francis T. Gidman was recently certified by the American Board of Surgery.

Dr. Woodard D. Beacham and Dr. Thomas Benton Sellers attended the Mid-Year Clinic of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons in Philadelphia, March 7-8.

Dr. Marshall Michel delivered a paper on Acute Malignant Obstruction of the Colon at the Southeastern Surgical Congress meeting in Louisville, March 10.

Dr. J. Kelly Stone was recently installed as president of the Southern Baptist Hospital staff; he succeeds Dr. John T. Sanders. Other officials installed were: Dr. W. Robyn Hardy, vice-president; Dr. E. Garland Walls, secretary; and Dr. Joseph Wells, treasurer.

The Medical Toastmasters no longer meet at the New Orleans Athletic Club at 6:30 p. m. on Thursdays. They now meet in the Hutchinson Memorial Auditorium at 8 p. m. on Thursdays.

In the near future Mr. Rudolph O. Vorbusch will give a course in Parliamentary Law, which he has presented most successfully at the Young Men's Business Club and other organizations. The general membership will be invited to participate in this course, or to attend as guest.

# LOUISIANA STATE MEDICAL SOCIETY NEWS

## CALENDAR

### PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

| Society | Date | Place |
|---|---|---|
| East Baton Rouge | Second Wednesday of every month | Baton Rouge |
| Morehouse | Second Tuesday of every month | Bastrop |
| Orleans | Second Monday of every month | New Orleans |
| Ouachita | First Thursday of very month | Monroe |
| Rapides | First Monday of every month | Alexandria |
| Sabine | First Wednesday of every month | |
| Second District | Third Thursday of every month | |
| Shreveport | First Tuesday of every month | Shreveport |
| Vernon | First Thursday of every month | |

THE RAPIDES PARISH MEDICAL SOCIETY

The regular monthly meeting of this organization was held on April 7 at the Hotel Bentley. The scientific program consisted of a very excellent

talk by Dr. I. Epstein on "Early Manifestation and Diagnosis of Tuberculosis as Applied to the General Practitioner."

## CHARITY HOSPITAL

A meeting of the Medical Division of Charity Hospital was held on Tuesday, April 15 at 8 p. m. in the Auditorium of the hospital. The program consisted of the following: A case presentation—whooping cough associated with possible heart failure by Dr. Ross C. Tilbury; a case presentation of a family epidemic of lead poisoning by Dr. David Spizer.

## TOURO INFIRMARY

The regular monthly meeting of the Medical Staff of Touro Infirmary was held on Wednesday, April 9 at 8 p. m. The Department of Pathology presented a clinico-pathologic conference with a discussion by Drs. Roy Turner and Gordon McHardy. Dr. Albert Braunstein spoke about Pathologic Ophthalmic Changes in Diabetes Mellitus, and Dr. Irving Glassberg presented a case report on Polycystic Kidney and Ureteral Obstruction.

## LOUISIANA STATE ALLERGY SOCIETY

On April 1 of this year a group of Louisiana allergists got together in Shreveport and formed the Louisiana State Allergy Society.

At this meeting Dr. Bernard G. Efron of New Orleans was elected president, Dr. Henry D. Ogden of New Orleans was elected vice-president and Dr. J. Dudley Youman, Jr., of Shreveport was elected secretary-treasurer.

A constitution was adopted at this same meeting.

The purpose of this society is to further the study of allergy, to promote discussion of the various aspects of allergy and to bring together the allergists of the state of Louisiana.

The meetings are to be held on the first day of the meeting of the Louisiana State Medical Society and in the same city as is the meeting of the Louisiana State Medical Society.

## LOUISIANA TUBERCULOSIS ASSOCIATION

The Louisiana Tuberculosis Association held an institute for workers at the Jung Hotel, April 17-19. Among those appearing on the program were Drs. Julius Lane Wilson, John M. Whitney, Robert Smith, Sydney Jacobs and Maurice Campagna. Dr. O. P. Daly presided at the luncheon meeting Friday, April 18.

## FACULTY APPOINTMENTS AT L. S. U.

The School of Medicine, Louisiana State University, announces the following faculty appointments:

Dr. Jerome T. Syverton, formerly associate professor of bacteriology, University of Rochester, as professor and head of the Department of Microbiology. In the past, the departments of pathology and bacteriology have been combined. Dr. Syverton will be responsible for the organization of a new department which will cover instruction and research in the basic factors in infectious disease, including bacteriology, virology, parasitology and immunology.

Dr. Curtis J. Lund, formerly associate professor of obstetrics and gynecology, University of Minnesota, as professor of obstetrics and gynecology on a full-time basis.

Dr. Harold L. Brauner, formerly instructor in pharmacology, Harvard University, as assistant professor of biochemistry, assigned to the Department of Pharmacology.

Dr. Leon Churney, formerly instructor in physiology, University of Pennsylvania, and recently released from military service, as assistant professor of physiology.

Dr. Allan L. Segal, formerly instructor in radiology, Columbia University, as clinical assistant professor of radiology.

Dr. James A. Wilson, formerly resident in obstetrics and gynecology, Charity Hospital of Louisiana, as instructor in obstetrics and gynecology on a full-time basis.

Dr. Harry D. L. Kaye, formerly resident in surgery at the New Haven Hospital and assistant in surgery, Yale University, as instructor in surgery on a full-time basis.

Dr. Philip B. Johnson, recently released from military service, as instructor in medicine on a full-time basis.

Other recent appointments include Dr. Juan E. Morales as clinical assistant in neuropsychiatry, Dr. Marie L. Surgi as assistant in pediatrics, and Dr. Robert M. Rose as clinical assistant in orthopedics.

## NEW DIRECTOR AT CARVILLE

The USPHS announces that Dr. Frederick A. Johansen has been named Director of the National Leprosorium at Carville. Dr. Johansen has been connected with the Institution for some 23 years and undoubtedly is one of the most outstanding leprologists in the world. He has been a source of inspiration to the staff of the hospital and to the patients there.

Dr. G. A. Faget, the former Director of the Institution, has been sick for some months and it is our understanding that the Public Health Service will give him an assignment which should be less demanding on his physical well-being than the post he has now relinquished.

## REFRESHER COURSE IN OBSTETRICS

At the request of the Louisiana State Department of Health, Section of Maternal and Child Health, the Tulane University School of Medicine

will offer a Refresher Course in Obstetrics June 2-14, 1947. Registration will be limited so that each physician may receive individual attention.

Tuition for the course will be paid by the Section of Maternal and Child Health of the Louisiana State Department of Health. In addition, each physician will be allowed a per diem of $6.00 for the thirteen days' attendance at the course, for which a check will be mailed to him shortly thereafter.

## AMERICAN MEDICAL ASSOCIATION RADIO PROGRAM

The American Medical Association radio program entitled "Stephen Graham, Family Doctor" is being carried regularly on Monday night from 9:30 to 10:00 p. m. CST by all of the Mutual Broadcasting Company stations in Louisiana. These include KPDR, KCIL, KANE and WNOE. This program is very well worthwhile and can be heartily recommended not only to doctors and their families but to their patients as well.

## LOUISIANA CONFERENCE OF SOCIAL WELFARE

Under the presidency of Dr. C. L. Mengis, Director of the St. Landry Parish Health Unit, Opelousas, a three-day conference on social welfare was held at the Jung Hotel in New Orleans April 15-17. On the program appeared, among others, Mr. Charles Mitchell, Director, Health and Hospital Division, Office of the Governor, who discussed the state program. Dr. John A. Lewis, U. S. P. H. S., presented a paper on "The National Hospital Survey and Construction Program." Mr. Homer L. Hitt, of Louisiana State University, presented a paper entitled "Health in Louisiana." At a sectional meeting on mental health, Dr. Wilton E. Kirkpatrick discussed the National Mental Health Act. The section on physical health was presided over by Dr. Waldo Treuting and the topic "National Health Insurance Comes of Age—The Taft Bill", was presented. At the luncheon meeting of the Louisiana Legislative Council, the speaker was Dr. George W. McCoy, head of the Department of Public Health, Louisiana State University of Medicine, who talked on the subject "Some Newer Considerations in the Management of Leprosy." The following day a luncheon meeting of the Louisiana Tuberculosis Association was held at which time Dr. Julius L. Wilson presided and Dr. Sydney Jacobs, of New Orleans, was the speaker.

## DEDICATION OF THE FOUNDATION HOSPITAL

On Sunday, April 13 the dedication exercises of the Foundation Hospital were held at the former Camp Plauche Hospital. The Invocation was pronounced by the Archbishop of New Orleans, Most Reverend Joseph F. Rummel. Dr. Ochsner acted as master of ceremonies and addresses were given by Mr. J. Blanc Monroe, Trustee of the Ochsner Foundation, Mr. Albert Scheidt, the new hospital director, Dr. Dean H. Echols, director of the education and research program and Dr. Walter Trautman, a Fellow of the Foundation. The Benediction was by Reverend John S. Land. Mr. Monroe, who gave the main talk of the afternoon, pointed out the difficulties that were encountered in organizing this new hospital. He spoke, as always, most felicitously and most entertainingly. He said that the hospital, which had been opened on January 20, 1947 with the admission of three patients, now had 166 beds occupied and that they were prepared to open additional units.

## L. S. U. SCHOOL OF MEDICINE

Doctor Edgar Hull, professor of Medicine, was a guest of the L. S. U. Medical Alumni at Shreveport on April 2 and 3. While there he met with the alumni group on several occasions, gave three lectures on medical topics and conducted ward rounds in Shreveport Hospital and a clinical pathological conference.

Doctor Hull attended the meetings of the American College of Physicians at Chicago on April 28-May 2. He is Governor of the College for Louisiana.

Doctors Charles M. Goss, professor, Ralph N. Baillif, assistant professor and George W. Hamlett, assistant professor of anatomy, attended and presented papers at the meeting of the American Association of Anatomists at Montreal, Canada, on April 3 and 5.

Doctor G. M. McCoy, professor and head of the Department of Public Health attended the following meetings: April 12, 1947, American Epidemiological Society, Boston, Mass.; May 6-7, Association of American Physicians, Atlantic City, N. J.

Doctor Alfred B. Longacre, clinical instructor in Surgery, has received a grant of $3,000.00 from Eli Lilly Research Fund for the purpose of conducting studies in nitrogen balance following the administration of protein hydrolysates.

Doctor Ralph F. Brauer, recently appointed assistant professor of pharmacology at the L. S. U. School of Medicine, and at present a member of the faculty of the Harvard Medical School, has received a grant of $5,000.00 from the National Institute of Health for research in the effect of liver injury upon liver and plasma proteins. Doctor Brauer will join the faculty at New Orleans and begin his studies on July 1.

## THE NEW ORLEANS GRADUATE MEDICAL ASSEMBLY

The New Orleans Graduate Medical Assembly at a meeting held April 25, elected the following mem-

bers for office for the year 1947-1948: Dr. Waldemar R. Metz, President-elect; Dr. Dean H. Echols, First Vice-President; Dr. Neal Owens, Second Vice-President; Dr. Maurice Lescale, Third Vice-President; Dr. Max M. Green, Secretary; Dr. Edwin H. Lawson, Treasurer; Dr. Edgar Hull, Director of Program; Dr. C. J. Tripoli, Asst. Director of Program; Dr. C. Gordon Johnson, Asst. Director of Program. Executive Committee: Dr. Hugh T. Beacham (two year term); Dr. John T. Sanders (two year term).

The following officers elected in 1946 for the coming year are as follows: Dr. Joseph S. D'Antoni, President. Executive Committee: Dr. William H. Gillentine, Retiring President; Dr. Lucien A. Fortier, Dr. Howard R. Mahorner.

## THE CENTRAL ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS

The Central Association of Obstetricians and Gynecologists, whose membership includes physicians from your State, offers two $100.00 each annual prize awards to any accredited physician, research worker, or medical student within the confines of the Central Association. Your State is within the confines of the Association. One award is for the best investigative work and the other for the best clinical work in the field of Obstetrics and/or Gynecology. Papers submitted for either of these awards must be in the hands of the Secretary not later than August 15, 1947.

## NEWS ITEMS

The ninety-fourth annual meeting of the New Orleans Academy of Sciences was held April 25-26. Dr. J. N. Ané and Dr. Mayerson, of Tulane, appeared on the program.

Dr. Michael E. DeBakey, Associate Professor of Surgery at Tulane University Medical School, was one of four additional physicians who were recently appointed honorary consultants to the Army Medical Library.

At a recent meeting of the Tulane Chapter of the American Association of University Professors Frank Lais, Jr., Executive Director of the Louisiana Physicians Service, Inc., addressed the members of the organization on the subject of surgical insurance.

The American Congress on Physical Medicine will hold its twenty-fifth annual scientific and clinical session September 2-6 at the Hotel Radisson, Minneapolis.

Dr. Bernardo Alberto Houssay, of Buenos Aires, Argentina, renowned as the world's greatest living physiologist, is to be the recipient of the first annual Research Award of the American Pharmaceutical Manufacturers' Association. Dr. Houssay is coming to this country at the APMA's invitation to receive the award in person. Dr. Anton J. Carlson, Emeritus Professor of Physiology at the University of Chicago who is known as the dean of American physiologists, will deliver the presentation address.

The National Gastroenterological Association will hold its twelfth Annual Convention and Scientific Sessions at the Hotel Chelsea in Atlantic City, N. J., on June 4-6, 1947, affording those interested in attending the centennial celebration of the American Medical Association and the meeting of the National Gastroenterological Association a chance to be present at both.

## POLIO PREPAREDNESS MEETING

The Louisiana State Department of Health, the National Foundation for Infantile Paralysis and the Orleans Chapter of the National Foundation jointly and holding their Polio Preparedness Meeting at the St. Charles Hotel in New Orleans, Friday, May 30, and Saturday, May 31.

The program provides for a general session to begin at 2:00 p. m., Friday, May 30 in the Jackson Room of the St. Charles, followed by a dinner meeting that evening at 7:30 p. m., in the Claiborne Room. Saturday morning, May 31, beginning at 9:30 a. m., there will be a professional session in the Beauregard Room. This meeting is exclusively for those who are engaged or interested in the medical care of infantile paralysis victims. Doctors, nurses, hospital people, medical social workers, physical therapists, are invited to attend the professional session.

Appearing on the program at the opening session will be Dr. W. L. Treuting, Dr. O. P. Daly and Dr. Kenneth Landauer, Director of Medical Care of the National Foundation for Infantile Paralysis. At the banquet in the evening, Mr. R. McLean Jeter will respond to the Welcome Address by Mayor Morrison. The two speakers at the banquet are Dr. G. W. McCoy, of the Louisiana State University Medical School and Dr. Clarence H. Webb, of Shreveport, Louisiana Chairman of the American Academy of Pediatrics. At the professional sessions Dr. Gilbert C. Anderson will preside and papers will be read by Dr. Myron Wegman, Professor of Pediatrics, Louisiana State University Medical School, Dr. Ralph Platou, Professor of Pediatrics at Tulane, and Dr. Guy A. Caldwell, Professor of Orthopedics at Tulane.

## NATIONAL ADVISORY HEALTH COUNCIL

Medical Research grants amounting to more than two million dollars have been recommended for the approval of Dr. Thomas Parran, Surgeon General, United States Public Health Service, by

the National Advisory Health Council. Grants are contingent upon appropriations by the Congress for the fiscal year 1948 which begins July 1, 1947.

Of the 193 grants that supplement existing funds of universities and other research institutions, the largest, $105,800, was recommended for a study of syphilis by the Pan American Sanitary Bureau. Sums of $52,454 and $46,000 respectively, were slated for the study of malaria by the University of Chicago and Christ Hospital, Cincinnati, Ohio. Six other grants were above a $30,000 level.

Research studies involved cover a diverse number of subjects including tropical diseases, biochemistry and nutrition, cardiovascular diseases, dental research, gerontology, hematology, pathology, physiology, surgery, antiobiotics, tuberculosis, bacteriology, pharmacology, radiobiology, metabolism and endocrinology, sanitation, virus and rickettsial infections, and public health methods. The use of grants in aid in pursuing these studies implies no degree of Federal control. The investigator may work with full independence and autonomy, submitting only a brief concise report of scientific progress annually.

An additional 55 grants were favorably considered but await modification of amount or further study by the Research Grants Division of the National Institute of Health before final action is taken.

The National Advisory Health Council is established by Congress and aids the Surgeon General in carrying out the research programs of the Public Health Service. It consists of 14 members, 10 of whom are experts, not otherwise employed by the government. They are: Dr. Edwin B. Fred, President, University of Wisconsin; Dr. Karl F. Meyer, Director, Hooper Foundation for Medical Research, University of California; A. Baird Hastings, Department of Biological Chemistry, Harvard University; John H. Musser, Professor of Medicine, Tulane University; Henry F. Vaughan, Dean, School of Public Health, University of Michigan; Harry S. Mustard, Professor of Public Health Practice, College of Physicians and Surgeons, New York City; Gordon H. Fair, Professor of Engineering, Harvard University; Carl S. Marvel, Professor of Organic Chemistry, University of Illinois; William C. Rose, Professor of Biochemistry, University of Illinois; and the most recent appointee, Dr. George Baehr, Clinical Professor of Medicine, Columbia University.

Four ex-officio members include the Director, National Institute of Health, Dr. Rolla E. Dyer; the Chief, Bureau of Medicine and Surgery, Navy Department, Captain O. L. Burton, USN; the Chief, Preventive Medical Services, Army Service Forces, Colonel Karl R. Lundeberg, USA; the Assistant Chief, Bureau of Animal Industry, Department of Agriculture, Dr. Harry W. Schoening.

## ATTENTION NAVAL RESERVE MEDICAL OFFICERS!

The attention of Reserve Medical Officers is invited to the opportunity to return to *active duty* at one of the major naval air stations of the Naval Air Reserve Training Command or at one of the Naval Air Reserve Training Units (NARTUs) listed below:

NAS Atlanta, Ga.
NAS Columbus, Ohio
NAS Denver, Colo.
NAS Dallas, Texas
NAS Glenview, Ill.
NAS Crosse Ile, Mich.
NAS Los Alamitos, Calif.
NAS Memphis, Tenn.
NAS Miami, Fla.
NAS Minneapolis, Minn.
NAS New Orleans, La.
NAS New York, New York
NAS Oakland, Calif.
NAS Olathe, Kans.
NAS Squantum, Mass.
NAS St. Louis, Mo.
NAS Willow Grove, Pa.
NARTU, NAS Anacostia, D. C.
NARTU, NAS Jacksonville, Fla.
NARTU, NAS Norfolk, Va.
NARTU, NAS Seattle, Wash.

Reserve Medical Officers who are interested in *active duty* at one of the stations or units listed above should initiate letters to the Bureau of Naval Personnel, via Chief of Naval Air Training, Naval Air Station, Glenview, Ill., and BuMed, listing three or four stations at which duty is desired in order of preference. Personnel are desired in rank of Commander and below in the Medical Corps. However, Captains may apply for duty in their rank, requesting waiver.

Officers qualifying for the above billets will not be subject to transfer and may terminate the tour of duty at own request. Flight Surgeons are assured of orders to duty involving flying. Government quarters are available at several of the major naval air stations. *Here is a chance for a reserve officer awaiting residency or fellowship in a civilian hospital to obtain a full time paying job in the meantime.*

## HEALTH IN NEW ORLEANS

The Bureau of the Census, Department of Commerce, reported that for the week closing March 15 there occurred in the City of New Orleans 156 deaths which were divided 113 white, 43 colored, with 11 of these deaths in children under one year of age. The three year median for the corresponding week shows 126 deaths so that this was not a particularly happy week for the citizens of New Orleans. The following week there was a marked improvement, the number of deaths reported being

127; 79 of these were in the white population and 48 in the colored with only seven of the total being in infants. There was a very large jump the following week which closed March 29. The number of deaths ascended to the high figure of 169. The racial distribution of these deaths was as follows: white 106, colored 63, with 18 infant deaths.

## INFECTIOUS DISEASES IN LOUISIANA

The weekly morbidity report for the State of Louisiana for the week ending March 8 showed cancer leading all other reportable diseases with a total of 153 cases. Following cancer, numerically, came unclassified pneumonia with 128 cases reported, 59 of measles, 57 of pulmonary tuberculosis, 34 of pneumonoccic pneumonia, 18 of influenza, 13 of amebiasis and 10 of chickenpox. There were no other diseases recorded in figures greater than ten. It should be noted, however, that four cases of poliomyelitis were reported. The following week which terminated March 15 saw unclassified pneumonia the first of all other reportable diseases with 101 cases. Other diseases occurring in numbers greater than 10 included 56 of measles, 42 of pneumococcic pneumonia, 35 of pulmonary tuberculosis, 19 of cancer, 18 of chickenpox, 13 of diphtheria and 12 of scarlet fever. This week there were six cases of poliomyelitis listed, scattered in various parishes throughout the state. For the first time in many months a case of pellagra was reported. The week which closed March 22 mumps led the reported diseases listed with 169 instances, followed by cancer with 119 cases, influenza with 85, chickenpox 66 and measles 42. The very high figure of unclassified pneumonia, 281, for the previous four weeks was remarkable as there were only five cases listed this week. Only one case of poliomyelitis appeared in the state this particular week. Influenza was apparently rampant the last part of March because 315 cases were reported for the week which closed March 29. Other diseases that were reported included 117 cases of measles, 76 of chickenpox, 68 of pulmonary tuberculosis, 40 of cancer, 36 of amebiasis, 14 of unclassified pneumonia and 11 of mumps. Again there was only one case of poliomyelitis reported.

Month Ending February 28, 1947

| | Total This Month | Total Previous Months | Total to Date 1947 |
|---|---|---|---|
| Chancroid | 57 | 58 | 115 |
| Gonorrhea | 1214 | 1284 | 2498 |
| Granuloma Inguinale | 9 | 9 | 18 |
| Lymphopathia Venereum | 10 | 9 | 19 |
| Syphilis | 844 | 966 | 1810 |

## JANE TODD CRAWFORD STUDENT LOAN FUND IN GYNECOLOGY

The Woman's Auxiliary to the Southern Medical Association has established a loan fund for young Southern physicians wishing to pursue the study of gynecology. The requirements are simple: he or she must not be over 32, of good character, and showing evidence of being capable of absorbing adequate knowledge.

Inquiries may be addressed to Mrs. J. Ullman Reaves, 1862 Government Street, Mobile 18, Alabama.

## AMERICAN PSYCHIATRIC ASSOCIATION

Child Psychiatry, Convulsive Disorders, Psychiatry and the Law, and the U.S.P.H.S. Program in Mental Health are among the topics to be reviewed at the annual meeting of the American Psychiatric Association to be held May 19-23 in New York City. The discussion will be led by such men as Dr. G. Brock Chisholm, Dr. Paul R. Hawley and Dr. William C. Menninger.

## LOUISIANA PHYSICIANS SERVICE ENJOYS RAPID GROWTH

The Louisiana Physicians Service, the Blue Shield Plan for surgical and obstetrical services, has now grown where it has more than 12,500 individuals covered by its program. The plan has had an enrollment increase since January 1, of 109 per cent through March 31 of this year.

The Blue Shield Plan as offered by Louisiana Physicians Service is the only plan sponsored in Louisiana by the doctors and is sponsored and approved by the Louisiana State Medical Society. The plan now has an actual net premium value of approximately $90,000. The plan started just about five months ago.

The "Blue Shield" Plan in Louisiana has been granted the Seal of Acceptance of the Council on Medical Service of the American Medical Association, and is one of the eighteen selected plans in the United States to enjoy full membership in Associated Medical Care Plans. Associated Medical Care Plans is a national organization for prepayment medical care plans.

The doctors' plan provides for the prepayment of surgical and obstetrical care and includes treatment of fracture and dislocations along with certain related benefits such as diagnostic x-ray, anesthesia, and laboratory services. By the payment of a small fee the employed individual may prepay the cost of his doctor's bill and through this method of cooperative participation eliminate the hazard of the catastrophic doctor's bill. The Blue Shield Plan offers, through the participating physician, complete surgical and obstetrical coverage to individuals whose annual income is less than $2,000 per year and to the family group whose aggregate annual income is less than $3,000 per year. This means that approximately 780 physicians throughout Louisiana have voluntarily agreed to perform complete surgical and obstetrical serv-

ices to individuals who come to them for service and whose income does not exceed the amount stated.

For the individual whose income is in excess of the amount stated the plan acts as an indemnity toward the doctor's bill. The plan is available to all persons irrespective of their annual income.

The subscriber has complete freedom of choice of his physician and may use any doctor anywhere in the United States and will be paid the amount for surgical procedure rendered as provided for in the schedule of the benefits. However, persons using a participating physician and whose income is below the amount stated are guaranteed complete service at no extra cost.

The plan is operated on a state-wide basis and at this time has established offices in the cities of Baton Rouge, Alexandria, Shreveport and Monroe. The home office of the company is in New Orleans.

Louisiana Physicians Service will have a booth at the annual meeting of the Louisiana State Medical Society and all doctors interested in obtaining additional information relative to the operation of the "Blue Shield" are invited to inquire at the booth where an individual explanation will be made. Additional literature on the plan may be obtained at the booth, or by writing to the home office of the company, Room 103, 1430 Tulane Avenue, New Orleans.

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## DOMINICK A. PALMISANO
1888-1947

Dr. Dominick A. Palmisano died Monday, April 21 at Hotel Dieu in New Orleans. Dr. Palmisano was 56 years of age, graduated from Tulane in 1913 and was in general practice in New Orleans until 1932. From that time on he specialized in eye, nose and throat work. He was a staff member of the Eye, Ear, Nose and Throat Hospital, Hotel Dieu, Woman's Dispensary and Charity Hospital, as well as a member of parish, state and national medical societies.

Dr. Palmisano's death will be a real loss to his numerous friends and patients.

## DAVID ADIGER
1889-1947

Dr. David Adiger died suddenly in New Orleans, at the age of 58 years, on April 2, 1947. Dr. Adiger was born in Poland in 1889, his family settling in St. Francisville a short time after his birth. He graduated from Tulane Medical School in 1913. After serving a two year internship at Charity Hospital he was house surgeon for a year.

Dr. Adiger was a member of the parish and state medical societies and of the American Medical Association and had been since 1915. He served two years in World War I and on his return began to specialize in gynecology and obstetrics. Dr. Adiger was a man of outstanding character. He was deeply beloved because of a warm-hearted personality and high ideals.

## PHYSICIAN WANTED

Doctor in rural community is retiring from practice in June, 1947 and would like to have doctor take over his practice. The town is on a paved highway and there is a radius of at least twelve miles in which to do general practice. An annual gross income of $12,000.00 is estimated. Well equipped office with x-ray, diathermy, ultra violet light, infra red light, and other appliances. Hospital facilities six miles from office. For further information communicate with office of New Orleans Medical and Surgical Journal.

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## WOMAN'S AUXILIARY

I am very grateful to Mrs. Milton Honigman for all the wonderful publicity furnished me from Rapides Parish Auxiliary. The members did a fine job with their publicity, for Mrs. Rex G. Fortenberry's lecture. In addition to the usual poster and printed advertisements they had radio publicity over Station KALB, with three announcements over this station. Rapides Auxiliary is taking a very active part in Cancer Control and will hold a special meeting in cooperation with the American Society for Cancer Control on February 28, with Mrs. H. C. Graham as chairman.

One of the outstanding functions of the year was the first fall meeting honoring Mrs. Arthur Long of Baton Rouge with a luncheon, in the Bentley Room of the Bentley Hotel with a large crowd in attendance.

During the Christmas holidays, a very festive event for doctors and their wives was enjoyed in the form of a dinner party at "Homewood," the palatial home of Mrs. Clarence Pierson, one of the cities most charming hostesses.

This is only some of the fine work Rapides Parish Auxiliary is doing. The results have been very gratifying.

Ouachita Parish has done some fine work and is also a very active and outstanding Auxiliary. They too worked long and untiringly on publicity preceding the lecture of Mrs. Rex Fortenberry, and the response was indeed gratifying.

Ouachita Auxiliary feels fortunate in having as a member Mrs. A. D. Tisdale who is a member of

State Presidents of Federated Clubs and to have her give her report on the New York Herald Tribune Open Forum which she attended in New York. She gave special emphasis on cancer control and research in the field of atomic energy in combating cancer as reported at the Open Forum.

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The Hygeia Chairman, Mrs. J. E. McConnell, reported more subscriptions sold than ever before in that Auxiliary.

At a Christmas luncheon, Dr. A. L. Anderson, Superintendent of the G. B. Cooley Sanitarium, spoke on anti-tuberculosis. He set forth a five year program planned for combating tuberculosis in Ouachita Parish and inspired the Auxiliary to aid the program in every way possible.

Ouachita Auxiliary honored their doctors on Doctor's Day with a specially planned dinner party.

You can see from this fine report that Ouachita Parish has had a full program representing plenty of time, effort and hard work.

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Another very wonderful report and one that we will all enjoy reading is that of Caddo Parish Auxiliary. In October this Auxiliary was honored by a visit from the State President, Mrs. Arthur Long, of Baton Rouge. A beautiful tea was given for Mrs. Long and the happy occasion was one to be long remembered by all attending. Mrs. Long was also named honor guest at a luncheon given by officers and board members of the Caddo Parish Auxiliary.

At the November meeting a very interesting report was given by Mrs. C. R. Gowen, Chairman of Cancer Control, on the district meeting of the American Cancer Control Society. The Auxiliary voted to sponsor the making of surgical dressings for terminal cancer cases. Dr. Lloyd W. Rowland, Director of the Louisiana Society for Mental Health, gave a most interesting and instructive discussion on the subject.

At the December meeting, Dr. M. E. Dodd, guest speaker, spoke of "Life Among the Maoris of New Zealand," stressing points of medical and social interest. The Auxiliary members brought toys which were distributed to the children of the Charity Hospital in Shreveport at a Christmas party.

Several of the members were quite active in the Christmas seal drive. Many members have taken an active part in the work of the Cancer Society and have sponsored a surgical dressing center.

This is only a few of the many worthwhile things accomplished by Caddo Parish Auxiliary. I wish that space permitted more be printed.

MRS. W. C. WIGINTON,
Chairman, Press and Publicity.

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### IN MEMORIAM

Died August 9, 1946: Mrs. C. P. Rutledge—Past President.

Died December 4, 1946: Mrs. F. A. Buvens.

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## BOOK REVIEWS

*Insect Microbiology*: By Edward A. Steinhaus. Ithaca, N. Y., Comstock Publishing Company, Inc., 1946. Pp. 763. Price $7.75.

Dr. Steinhaus who is an authority in the field has here summarized current knowledge concerning the associations of microbes with insects and ticks. The book is particularly noteworthy for its comprehensiveness, since it treats bacteria, rickettsiae, viruses, yeasts, fungi, spirochetes and protozoa. For example, nearly 100 pages are devoted to a discussion of the rickettsiae while over 70 pages of the text deal with intracellular bacterium-like or rickettsial-like symbiotes. There is an extensive bibliography of pertinent literature at the end of the book, together with subject and author indexes. Microphotographic reproductions and diagrams are numerous and for the greatest part, exceedingly good. The book can be highly recommended as a reference source to all students of medicine as well as those interested in veterinary or plant infectious diseases and entomology.

M. F. SHAFFER, Ph.D.

*Music in Hospitals*: By Willem van de Wall, New York, Russell Sage Foundation, 1946. Pp. 86.

Not many books of this type appear on the market. The value of this work, however, lies not in its uniqueness but in the evident knowledge of the author of the field with which he deals in the course of the work.

It has long been axiomatic that music is, in itself and in its appreciation, an excellent therapy for human ills, particularly of the emotional type. And in recent years some effort has been made to make use of this age-old remedy in the rehabilitation of those whose emotional unbalance has made them ill. However, few if any authors have so worked out a plan as has Mr. van de Wall.

The work is most certainly worthy of commendation. Of particular value are his studies of the effect of music in normal living, the nature of individual responses to music, and, most especially, the chapter in which he details the technic of actual hospital musical programs. There has been much confusion of thought and practice in the

latter field. Musicians have been willing to render their services, but so many haphazard acceptances of their attempts have tended, in many cases to frustrate the effectiveness of musical therapy, rather than to permit the application of its full value. A definite, graduated program—or at least the suggestion of a method of organizing one—has long been needed. It is most gratifying to find the author of this work offering such a clear delineation of the most effective methods of procedure.

*Music in Hospitals* is a small work but mighty—for it fills a long-felt need. The author modestly refers to it as: "a collection of thoughts and suggestions based on practical experience and offered for purposes of information and stimulation." It is far more than that. May it fulfill its purpose, so well presented by the author, of developing interest in music as a therapy for healthier emotional living.

B. J. CUNNINGHAM, C. M.

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*Henry Sewall, Physiologist and Physician*: By Gerald B. Webb and Desmond Powell. Baltimore, The Johns Hopkins Press. 1946. Pp. 189. Price $2.75.

Henry Sewall started his long scientific career in 1876 as an assistant to Henry Newell Martin, the first professor of physiology at Johns Hopkins University. After three years under Martin he spent several years abroad, studying with Ludwig in Leipzig, Kuhne in Heidelburg, and Sir Michael Foster in London. In 1882 he was called to the University of Michigan to organize the Department of Physiology in its medical school.

The rest of the story of his life until his death in 1936 is a record of remarkable achievement in the face of heroic struggle against tuberculosis, which Sewall developed soon after going to Ann Arbor. In between bouts of illness he found time to teach, to make many friends, and to do experimental work. When he finally realized that he could not endure the climate in Michigan, he gave up his post in physiology, left Ann Arbor, and courageously entered the practice of medicine. After a year as resident physician with Trudeau at Saranac, Sewall migrated to Denver, where he taught physiology and medicine in the University of Colorado Medical School for approximately thirty years, while carrying on an active medical practice.

While Sewall made some valuable contributions to physiology during his years in Michigan, the work for which he is most famous is the proof of the efficacy of immunization to snake venom. These experiments were published in 1887, and as the authors point out, "Sewall did more than to establish a fact; he recognized its implications and pointed them out to future investigators."

As a physician, Sewall devoted himself to the problems of his community and of medicine at large. He pioneered in public health measures, wrote vigorously against the anti-vivisectionists, and became a leader in the field of tuberculosis. His services were much in demand as a consultant and as a leading citizen.

The authors have told the story of this remarkable man in an interesting and sympathetic fashion. Sewall worked through an exciting, pioneer period in physiology and medicine. In telling the story of Sewall's life and achievement, the authors have, of necessity, recounted much of the progress of medical investigation and thought of the early part of the century.

H. S. MAYERSON, Ph. D.

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*Urgent Surgery*, Volume I: Ed. by Julius L. Spivack, M. D., LL. D. Springfield, Charles C. Thomas, 1946. Pp. 714. 244 fig., 572 illus., 14 in color. Price $10.

This is a difficult book to evaluate fairly. For one thing, this is volume I, but nowhere in the preface or in the publisher's notice on the cover is there any intimation of the scope of the proposed work, how many other volumes there will be, or what subjects they will treat. This volume, which is the work of seven contributors in addition to the editor, contains eighteen chapters, thirteen of which deal with intra-abdominal conditions. The other five chapters are concerned, respectively, with intravenous infusion and blood transfusion; shock, hemorrhage, septicemia and gas gangrene; anesthesia; electrosurgery; and laparotomy. The inclusion of gas gangrene, the discussion of which is chiefly concerned with its occurrence in the extremities, in this particular volume does not seem entirely logical, nor does a chapter on electrosurgery seem indicated in a volume dealing with urgent surgery.

The editor's definition of urgent surgery seems itself somewhat confusing. Emergency surgery, he points out in the preface, some years ago was limited to accidents, principally traumatic, and to tracheal obstruction by foreign bodies. The development of diagnostic facilities (should not the development of surgical technics and of anesthesia also be included?) led to surgery for ruptured viscera and for intestinal obstruction. Today, the elements of time and space have been overcome by rapid transportation. Even in rural districts, well equipped hospitals staffed by competent surgeons are within comparatively easy reach (a generalization with which some observers would quarrel), and on that basis alone the term emergency surgery, the editor believes, can justifiably be replaced by the term urgent surgery. Emergency surgery implied the necessity for intervention within minutes or hours. Urgent

surgery is concerned with conditions in which operation becomes imperative within a few days if life and health are to be preserved. The notice on the cover states that the book deals with conditions requiring immediate or almost immediate intervention, and, in particular, with conditions in which operation becomes imperative within a day, or at the most within two days, if life and health are to be preserved.

The reasoning is difficult to follow, and more difficult to correlate with the text. Surely the availability of transportation and of a good surgeon has nothing to do with the concept, which still prevails, that acute appendicitis, for instance, or intestinal obstruction, is a condition in which the sooner operation is performed the better, and in which the mortality increases with each hour of delay. Carcinoma of the large bowel, like all malignancy, is urgent in the sense that the patient will certainly die without radical operation, but abdominoperineal resection is not usually conceived of as urgent surgery. Furthermore, if carcinoma of the large bowel is regarded as an urgent condition, it would seem reasonable to include in the same category carcinoma of the stomach, which is more frequent, but which is not discussed at all except in a section devoted to perforation of gastric malignancy. Six pages are devoted to volvulus of the stomach, of which less than a hundred cases have been reported, but less than a page to volvulus of the colon, which is many times more frequent.

In general, there can be little quarrel with the methods of therapy proposed for the conditions discussed. There is proper emphasis on typical cases of acute appendicitis, but the discussion of what happens clinically twenty-four and forty-eight hours after the onset of the disease is much too leisurely; acute appendicitis can be far advanced at the end of the second day. Not sufficient emphasis is placed upon the serious potentialities of the obstructive type of acute appendicitis, nor would there be universal agreement with the statement that statistics prove the value of abstinence from surgery in peritonitis following rupture of the appendix. Exception might well be taken, too, to the conservative therapy of appendiceal abscess in childhood. Far more emphasis should be put upon the dangers of primary resection in the face of malignant obstruction of the colon, which carries a prohibitive mortality.

The bibliographies are uneven. There are many recent references, but many others which could profitably be replaced by later ones; some of them would invalidate the earlier references. In the chapter on transfusion, for instance, the most recent reference is to a text published in 1942, which naturally takes no account of the enormous military experience with transfusion accumulated after that date. The same comment is applicable to the references on shock. There are two references to Moon's somewhat embattled concepts, but no reference at all to the experiences of World War II, which overturned a good many former theories.

In many instances references in the text are not listed in the chapter bibliographies. Some names are spelled incorrectly. Exact statistics are frequently cited without their source. Incidentally, the background statistics for acute appendicitis are for the years 1935 and 1936. Bureau of Census statistics are available in detail through 1945, some for 1946 are now available, and comparative statistics are also available as late as 1944. Acute appendicitis is still a very serious disease, but the last three or four years have shown an enormous improvement, and quotation of ten-year-old figures naturally does not reflect it.

In spite of these strictures the book has numerous good points. Cole's chapter on the pancreas, for instance, is very well done and sticks close to the ordinary concept of emergency (urgent) conditions. Paine's chapter on intestinal obstruction is equally good. The illustrations, done under the direction of Tom Jones, are generally clear and helpful.

FREDERICK FITZHERBERT BOYCE, M. D.

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*Gynecological and Obstetrical Pathology, with Clinical and Endocrine Relations*: By Emil Novak, A. B., M. D., D. Sc. (Hon. Dublin), F. A. C. S. 2d ed. Philadelphia, W. B. Saunders Co., 1947. Pp. 570. 542 illus., 15 in color. Price, $7.50.

The second edition of Gynecological and Obstetrical Pathology by Dr. Emil Novak is more than welcome. The first edition filled a much needed place in the library of the clinician, pathologist and student of gynecology and obstetrics, and this edition brings the subject up to date. The second edition follows the same format as the previous, beginning with a discussion of the endocrinology of the menstrual cycle and pregnancy and following with the discussion of the various organs of the female genital tract, including vulva, vagina, cervix, endometrium, uterus, fallopian tubes, uterine ligaments and ovaries with brief review of the embryology and histology of each, as well as the pathology.

The chapters devoted to the tumors of the ovary are of particular interest and represent as authoritative a compendium on the subject as it is possible to obtain in a single text, particularly when one considers that the particular subject matter is a favorite of Dr. Novak, and one in which he is probably "the" authority today.

The remaining chapters dealing with ectopic pregnancy, endometrial implantation and placentation, hydatidiform mole, chorio-epithelioma-malignum and abnormalities and diseases of the pla-

centa and appendages are no less valuable in content.

The addition of many new photographs, microscopic and gross, including several color plates, with close correlation to text, enhance the value of this text as an instrument of ready reference as well as an aid to teaching.

Last but not least, Dr. Novak's refreshing style makes the reading enjoyable as well as profitable. Chapter references are of inestimable aid to those who wish to pursue more deeply into selected topics. This text should be regarded as required reading, for everyone interested in the diseases of women and should be readily available for constant and repeated reference.

J. H. COLLINS, M. D.

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*Modern Management in Clinical Medicine*: By F. Kenneth Albrecht, M. D. Baltimore, The Williams and Wilkins Company. 1946. Pp. 1238 illus. Price $10.

Careful study of this useful volume convinces one that it is the contribution of a clinical pragmatist whose experiences in ward and clinic have been both extensive and fruitful. Dr. Albrecht's avowed effort to present comprehensive and modern material upon the management of clinical entities in readily available form has been successful. Especially valuable is the exhaustive consideration of semiological approaches to the adequate study of clinical cases. Excellent illustrations, many in full color, contribute much to clarity and forcefulness of presentation. The prime feature of the contribution is that specific and detailed recommendations are made in considering the therapy of each entity; the fact that trade names of therapeutic agents are used enhances the value of the material.

Chapters on the management of common dermatoses, venereal diseases and geriatric problems are especially good.

In the discussion of the management of diabetic acidosis the vehemence of one statement: *"The second most serious error one can commit is to administer glucose"* may not win complete agreement from many clinicians of wide experience.

Since it has a well-organized index, a pleasing format and presents valuable material in readily available form the volume "wears well" in daily use. It should have wide appeal, particularly to busy practitioners of general medicine.

EDWIN S. KAGY, M. D.

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*A Handbook of Commonly Used Drugs*: By Michel Pijoan, B. A., M. D. & Clark H. Yaeger, M. D., Dr. P. H. Springfield, Charles C. Thomas. 1947. Pp. 198. Price $3.75.

As stated in the preface this book represents the accumulation of notes dealing with drugs, preparations and technics which have been found useful in the actual experience of the authors. Among the groups of drugs considered are the analgesics and hypnotics, central nervous system stimulants, autonomic drugs, cardiovascular drugs, diuretics, oxytocic agents, hormones, vitamins, hematologic agents, metallic compounds, general antiseptics, sulfonamides, antibiotics, etc. Since the scope approaches that of most texts on pharmacology the discussion in each case is necessarily synoptic in a volume of this size. Furthermore the extent of treatment is undoubtedly influenced by the personal interests and experience of the authors. For example, the general anesthetics are omitted and ergonovine is dismissed with two short sentences while approximately one quarter of the book concerns the treatment of tropical diseases. Therapeutic applications rather than mechanisms of action are usually stressed. In an appendix are a number of useful prescriptions and other miscellaneous material. Although this book contains much useful information the physician is advised to examine it before purchasing it in order to assure himself that it will satisfy his needs in this field.

RALPH G. SMITH, M. D.

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*Postgraduate Obstetrics*: By Wm. F. Mengert, M. D., New York, Paul B. Hober, Inc., 1947. Pp. 392. Price $5.00.

Written primarily for the general practitioner, this book covers adequately the usual obstetric problems encountered and places less emphasis on rarer complications, theory being kept to a minimum.

The diagnosis of pregnancy, prenatal care, minor ailments of pregnancy, related disease complications and unrelated intercurrent diseases, abortion and premature labor, hemorrhages, cesarian section, normal conduct of labor, analgesia, forceps, prolonged labor, the normal and abnormal puerperium, care of the newborn, sterility, laboratory procedures and nursing technics are all covered in an adequate manner. The indications and contraindications relative to cesarean section are excellent. General principles are more emphasized with less attempt at great detail, in most sections of the book, in a clear, concise, readable fashion. This is one of the stated purposes of the author and a valuable feature of his book, in his avoidance of theory and controversy.

Some might question a few recommendations as to the termination of pregnancy in the second trimester by rupture of the membranes and occiput posterior might have been given more emphasis, but by and large this is an excellent conservative, thoroughly modern book on obstetrics primarily

written for the man that delivers most of America's babies—the family doctor.

CALVIN M. JOHNSON, M. D.

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*Compleat Pediatrician*: By W. C. Davison, M. A., D. Sc., M. D. Duke University Press, Durham, N. C., 1946. Pp. 256. Price $3.75.

The Compleat Pediatrician is an old book brought up to date. I have always had a copy of this in my library and think it is the most concise, detailed reference a pediatrician can find. The man doing general work will find help for any of his pediatric problems here.

SUZANNE SCHAEFER, M. D.

## PUBLICATIONS RECEIVED

Froben Press, New York: If You Need an Operation by Richard A. Leonardo, M. D., Ch. M., F. I. C. S.

Lea & Febiger, Philadelphia: The Head, Neck and Trunk by Daniel P. Quiring, Ph. D.; Therapeutic Exercise by F. H. Ewerhardt, M. D. and Gertrude F. Riddle, B. S., R. N., R. P. T.

Mack Publishing Company, Easton, Pa.: The Pharmacopoeia of the United States of America, Official Copy No. B 963.

Williams & Wilkins Company, Baltimore: Obstetrical Practice by Alfred C. Beck, M. D.